

DOCUMENT A00803

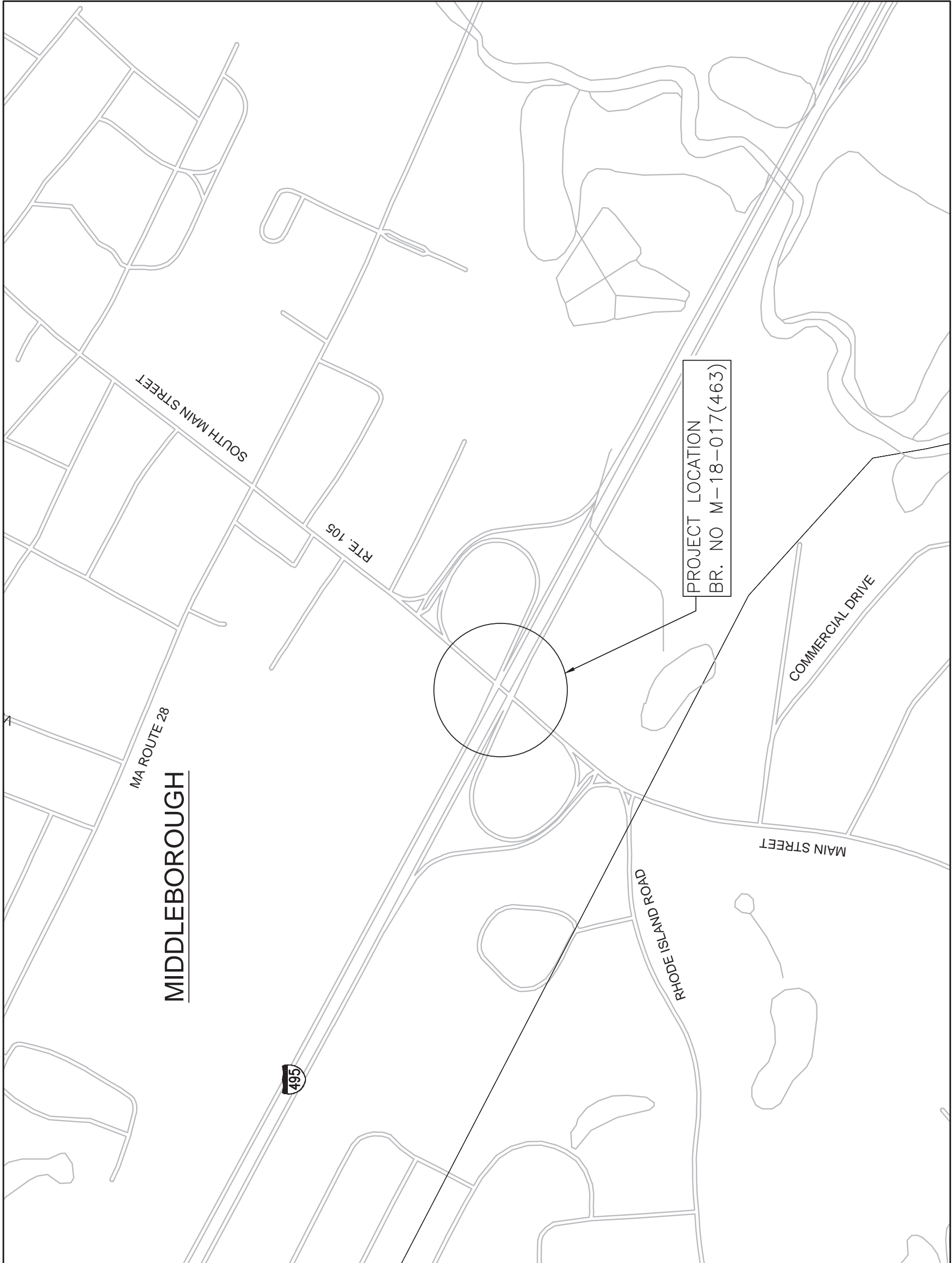
DRAWINGS AND SKETCHES

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MIDDLEBOROUGH
I-495 AT ST105 & MBTAMACRR

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	1	28
PROJECT FILE NO. 612743			

GENERAL NOTES, LOCUS, DRAWING LIST



LOCUS MAP
SCALE: N.T.S.

GENERAL NOTES:

EXISTING CONDITIONS:
THE CONTRACTOR SHALL DETERMINE AND ESTABLISH ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK BY FIELD MEASUREMENT AND SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUACY AND ACCURACY THEREOF AND SHALL NOT ORDER ANY MATERIALS OR COMMENCE ANY FABRICATION UNTIL THE REQUIRED MEASUREMENTS HAVE BEEN MADE ON THE ACTUAL STRUCTURE AND THE EXTENT OF PROPOSED WORK HAS BEEN APPROVED BY THE ENGINEER.

EXISTING BRIDGE PLANS:
PLANS FOR THE EXISTING BRIDGE ARE AVAILABLE AND MAY BE REQUESTED ELECTRONICALLY FROM MASSDOT PLANS AND RECORDS.

SCALES:
DRAWINGS ARE DRAWN TO SCALE FOR FULL SIZE SHEETS (24"X36") MAY HAVE BEEN PRINTED ON REDUCED SIZED PRINTS. CONTRACTOR SHALL VERIFY SCALES PRIOR TO SCALING FROM PLANS.

UTILITIES:
THE CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL EXISTING UTILITIES.

SHOP DRAWINGS:
THE CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS AS REQUIRED BY THE STANDARD SPECIFICATIONS AND THE LATEST MASSDOT BRIDGE MANUAL. PROPOSED COMPONENTS REQUIRING FIELD MEASUREMENTS SHALL BE DESIGNED, DETAILED, AND SUBMITTED TO THE ENGINEER FOR APPROVAL.

CONCRETE:
ITEM 901. 4000 PSI 1.5 INCH, 565 CEMENT CONCRETE
ITEM 905. 4000 PSI 3/4 INCH, 660 CEMENT CONCRETE
ITEM 905.01 4000 PSI 3/4 INCH, 660 CEMENT CONCRETE
ITEM 909.3 RAPID SETTING LOW PERMEABILITY CEMENT CONCRETE

SECTION MARK:

REPAIRS, PARAPET REPAIRS

SECTION NUMBER



SHEET NUMBER WHERE THE
DETAIL/SECTION CAN BE FOUND

SHEET NUMBER	DRAWING LIST
1	GENERAL NOTES, LOCUS, DRAWING LIST
2	DECK PLAN
3	FRAMING PLAN
4	PIER ELEVATIONS (1 OF 4)
5	PIER ELEVATIONS (2 OF 4)
6	PIER ELEVATIONS (3 OF 4)
7	PIER ELEVATIONS (4 OF 4)
8	ABUTMENT ELEVATIONS (1 OF 2)
9	ABUTMENT ELEVATIONS (2 OF 2)
10	CONCRETE REPAIR DETAILS (1 OF 2)
11	CONCRETE REPAIR DETAILS (2 OF 2)
12	CONCRETE BEAM ENCASEMENT DETAILS (1 OF 2)
13	CONCRETE BEAM ENCASEMENT DETAILS (2 OF 2)
14	JOINT REPAIR DETAILS
15	MEDIAN APPROACH SLAB DETAILS
16	ABUTMENT WEEP HOLE DETAILS
17	SPECIAL SLOPE PAVING DETAILS (1 OF 2)
18	SPECIAL SLOPE PAVING DETAILS (2 OF 2)
19-28	TEMPORARY TRAFFIC CONTROL PLANS

9/16/2023

ISSUED FOR CONSTRUCTION



PROPOSED BRIDGE PRESERVATION

MIDDLEBOROUGH

INTERSTATE ROUTE 495 OVER
STATE ROUTE 105 AND MBTA/MACRR

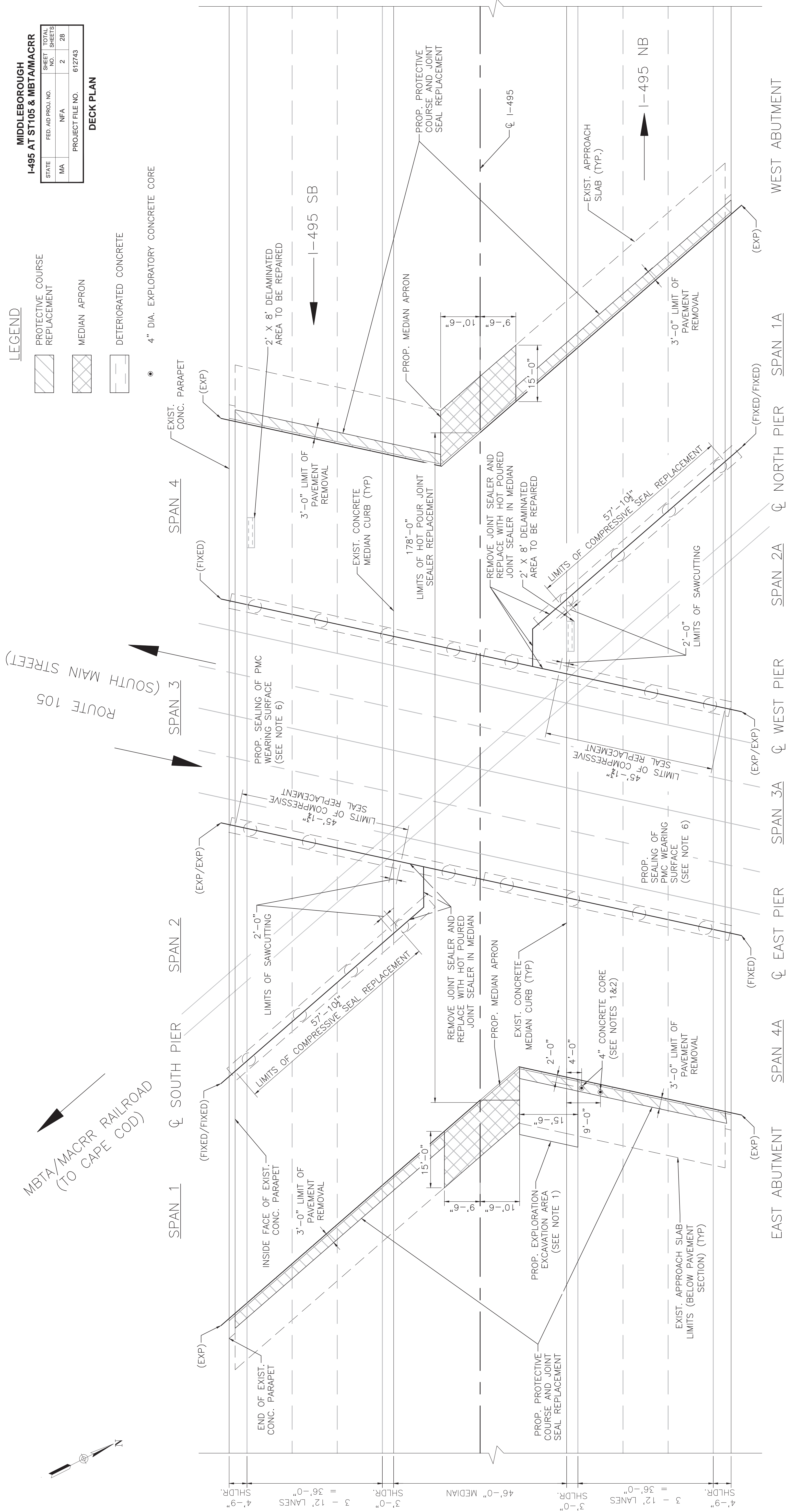
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

STATE BRIDGE ENGINEER

CHIEF ENGINEER



Engineering
Planning
Construction Management
GPI
878.570.2839
181 Ballouville Street, Suite 202
Wilmington, MA 01887
GPI.NET.COM



PLAN VIEW

SCALE: 1" = 150'-0"

1. CONTRACTOR TO EXCAVATE FILL ABOVE THE APPROACH SLAB IN THE PROPOSED EXPLORATION AREA, AS SHOWN AT THE EAST ABUTMENT FOR THE ENGINEERS TO INSPECT. A WATER/DYE TEST TO BE PERFORMED AS DIRECTED BY THE ENGINEER AND PAID FOR UNDER ITEM 968.5.
2. INSPECTION PORTS TO BE CORED THROUGH THE APPROACH SLAB TAKING CARE TO AVOID THE EXISTING REINFORCING STEEL. CORE HOLES TO BE DRILLED UNDER THE SUPERVISION OF THE ENGINEER AND PAID FOR UNDER THE ITEM 968.5.
3. IF VOIDS ARE FOUND UNDER THE APPROACH SLAB, CAMERAS OR OTHER METHODS PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER WILL BE UTILIZED TO DETERMINE THE EXTENT OF THE VOIDS.
4. PARTIAL EXCAVATION OF THE APPROACH SLAB MAY BE REQUIRED BY THE ENGINEER. ADDITIONAL EXCAVATION WILL BE PAID UNDER ITEM 100.1 BASE LABOR RATE AND NON—BID ITEMS.
5. IF VOIDS ARE FOUND AND FURTHER APPROACH SLAB EXCAVATION IS NOT REQUIRED, THE VOIDS ARE TO BE FILLED WITH EXCAVATABLE FLOWABLE FILL THROUGH THE OBSERVATION PORTS. FLOWABLE FILL INSTALLATION SHALL BE PAID UNDER ITEM 968.5.
6. EXPOSED CONCRETE DECK TO BE SEALED WITH TWO (2) COATS OF METHACRYLATE SEALANT. APPROXIMATE AREA = 18,064 SF

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STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	3	28
PROJECT FILE NO. 612743			

FRAMING PLAN
SCALE: 1" = 150'-0"

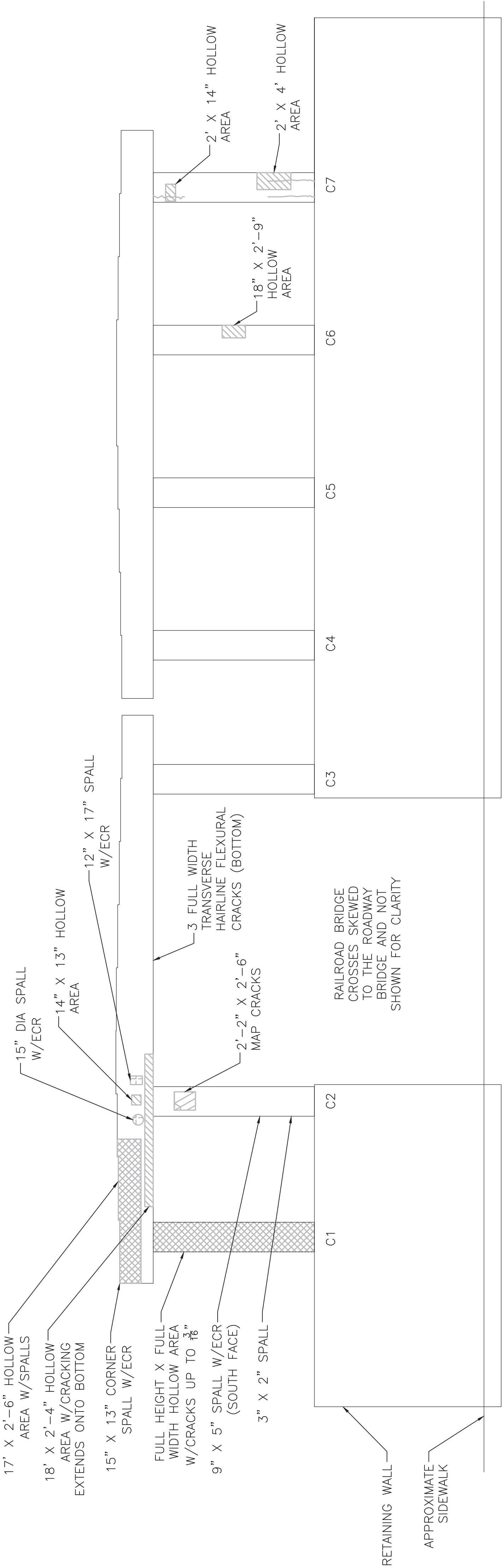
1. FOR CONCRETE ENCASEMENT DETAILS SEE SHEETS 12 & 13.
2. STEEL TO BE CLEANED AND PAINTED UNDER ITEM 961.201, APPROXIMATE AREA IS 41,500 SF.

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MIDDLEBOROUGH
I-495 AT ST105 & MBTAMACRR

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	4	28
PROJECT FILE NO. 612743			

PIER ELEVATIONS (1 OF 4)



EAST PIER: EAST ELEVATION

SCALE: 1/8" = 1'-0"

LEGEND

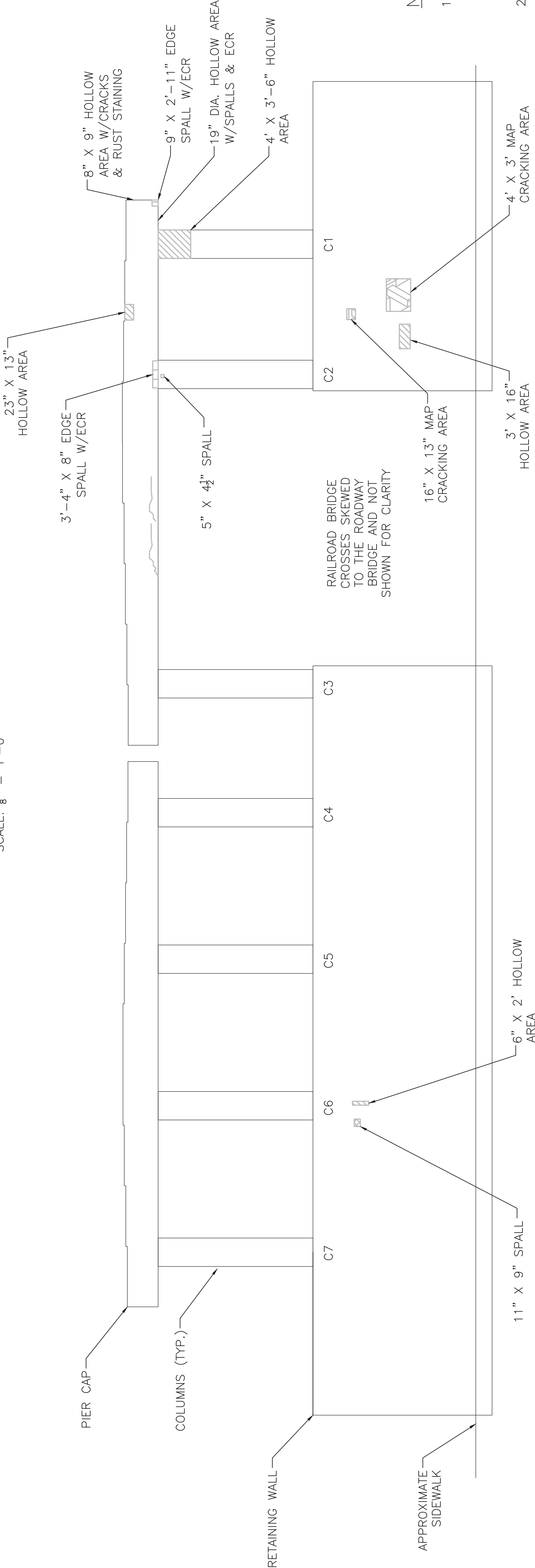
HOLLOW

SPALL

SPALL W/ECR

MAP CRACKING

ECR = EXPOSED AND CORRODED REINFORCEMENT

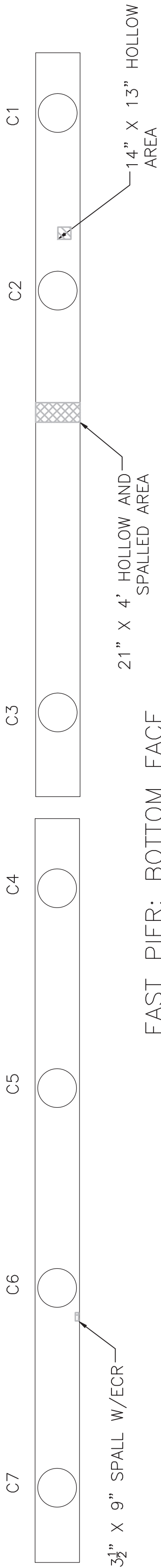


EAST PIER: WEST ELEVATION

SCALE: 1/8" = 1'-0"

NOTES:

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- FOR CONSTRUCTION REPAIR NOTES SEE SHEETS 10 & 11.
- THE CONTRACTOR SHALL SOUND ALL CONCRETE SURFACES IN THE FIELD AND MARK OUT SPALLED, DETERIORATED AND DELAMINATED CONCRETE AREAS TO BE APPROVED BY THE ENGINEER BEFORE THE CONTRACTOR COMMENCES ANY REPAIRS.
- ALL CONCRETE SURFACES EXCEPT THE BOTTOM FACE OF PIER CAPS ARE TO BE COATED UNDER ITEM 964.21. APPROXIMATE AREA 8,498 SF.



EAST PIER: BOTTOM FACE

SCALE: 1/8" = 1'-0"

MIDDLEBOROUGH			
I-495 AT ST105 & MBTAMACRR			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	5	28
PROJECT FILE NO. 612743			

PIER ELEVATIONS (2 OF 4)

LEGEND

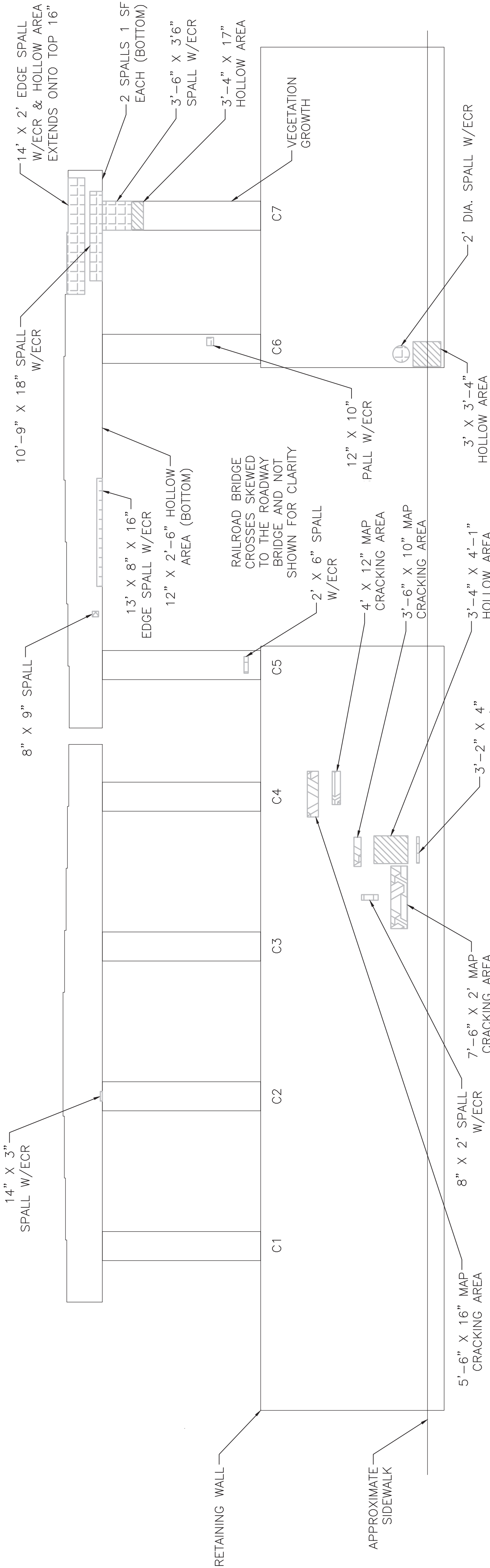


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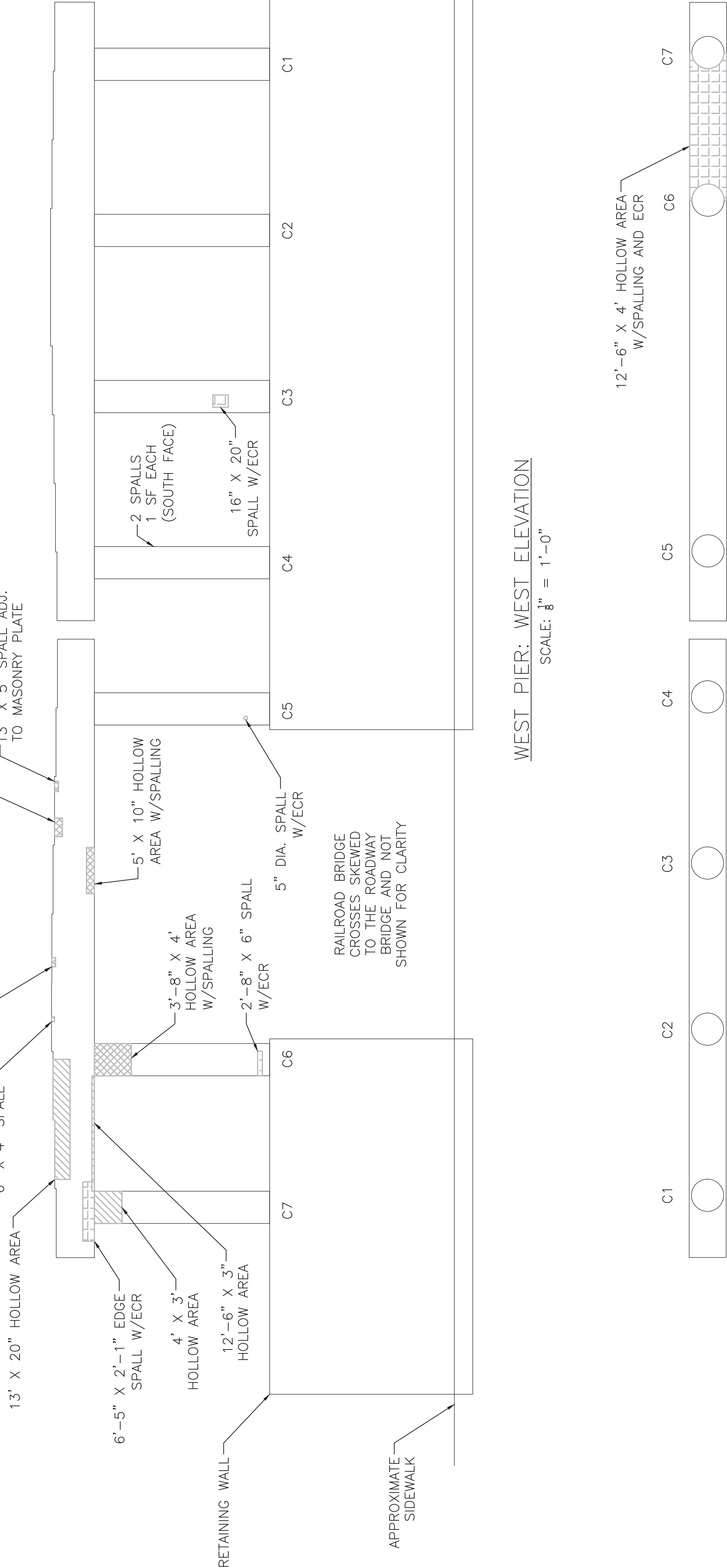


WEST PIER: EAST ELEVATION

SCALE: 1/8" = 1'-0"

WEST PIER: WEST ELEVATION

SCALE: 1/8" = 1'-0"



WEST PIER: BOTTOM FACE

SCALE: 1/8" = 1'-0"

MIDDLEBOROUGH

I-495 AT ST105 & MBTAMACRR

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	6	28

PROJECT FILE NO. 612743

PIER ELEVATIONS (3 OF 4)

140 SF HOLLOW AREA W/SPALLING (BOTTOM)

16" X 5" HOLLOW AREA W/SPALLING (BOTTOM)

2'-4" DIA HOLLOW AREA W/SPALLING (BOTTOM)

PIER CAP

3'-8" X 4'-5" HOLLOW AREA

7" X 6" HOLLOW AREA

4' X 4'-3" HOLLOW AREA W/SPALLING AND ECR

6'-3" X UP TO 3'-4" HOLLOW AREA W/SPALLING

7' X 13" SPALL W/ECR UNDERMING B19 (TOP)

7' X 12" SPALL W/ECR

FULL HEIGHT X FULL WIDTH SPALL W/ECBR

COLUMNS (TYP.)

C1 C2 C3 C4

3' X 2'-5" HOLLOW & SPALLED AREA W/ECR

NORTH PIER: EAST ELEVATION
SCALE: 3/8" = 1'-0"

HOLLOW

SPALL

SPALL W/ECR

MAP CRACKING

ECR = EXPOSED AND CORRODED REINFORCEMENT

5' X 12" HOLLOW AREA W/RUST STAIN

2' X 8" HOLLOW AREA W/CRACKS

7' X 16" X 3" SPALL W/ECR (TOP)

7' X 6" HOLLOW AREA

PIER CAP

3' X 2'-6" HOLLOW AREA W/CRACKS

COLUMNS (TYP.)

5' X 8" HOLLOW AREA

7" X 12" HOLLOW AREA

3'-6" X 2'-10" HOLLOW AREA W/SPALL AND CRACKS

3'-6 X 5'-4" HOLLOW AREA W/CRACKS

16" X 14" SPALL W/ECR

3" DIA X 1-1/2" DEEP POP OUT W/ECR

C1 C2 C3 C4

NORTH PIER: WEST ELEVATION
SCALE: 3/8" = 1'-0"

140 SF HOLLOW AREA W/SPALLING (BOTTOM)

5' X 4" HOLLOW AREA

C1 C2 C3 C4

NORTH PIER: BOTTOM FACE
SCALE: 3/8" = 1'-0"

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USE ONLY PRINTS OF LATEST DATE	

SHEET 6 OF 18 BRIDGE NO. M-18-017 (463)

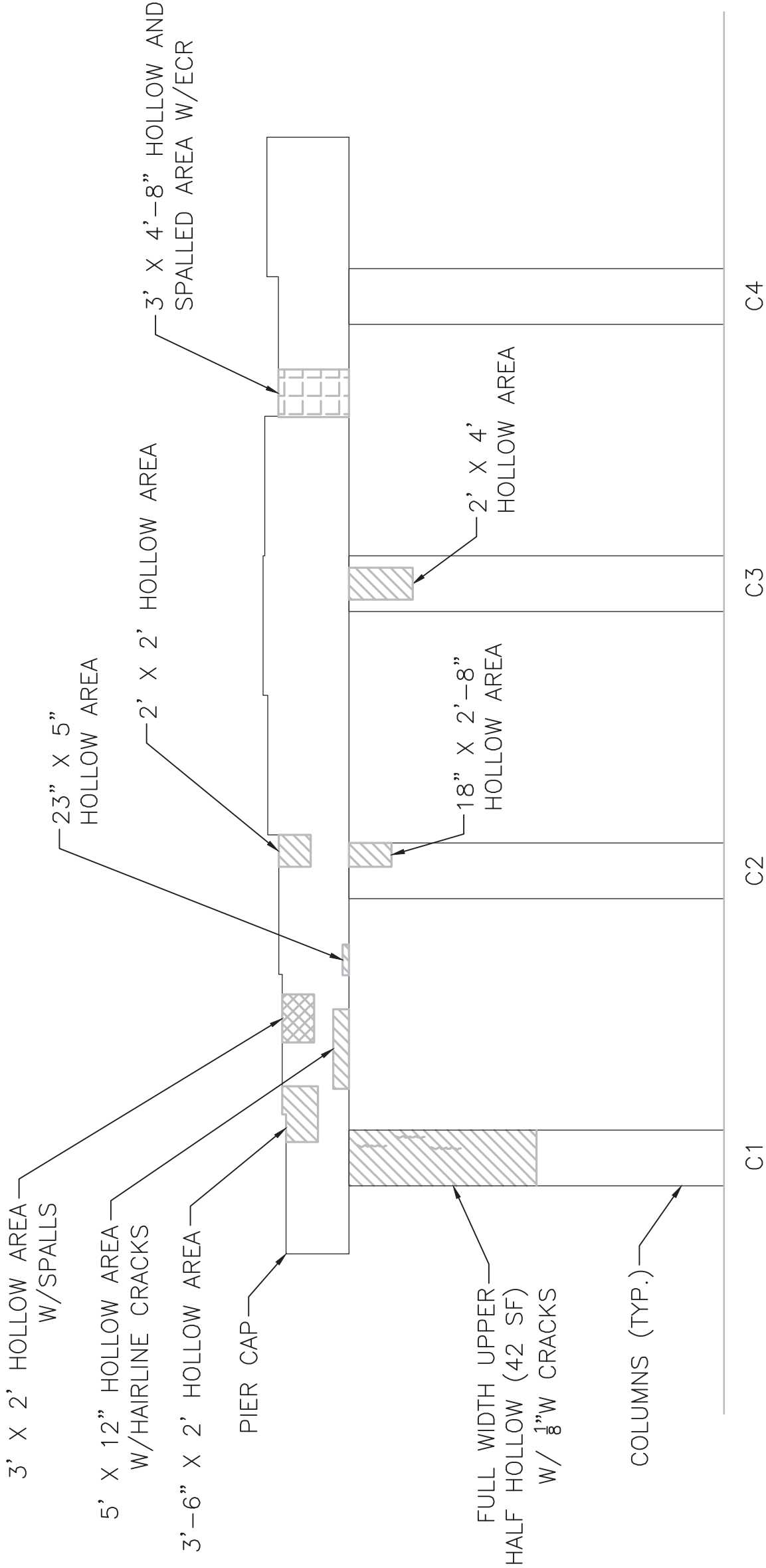
PS&ES SUBMISSION
September 12, 2023

MIDDLEBOROUGH

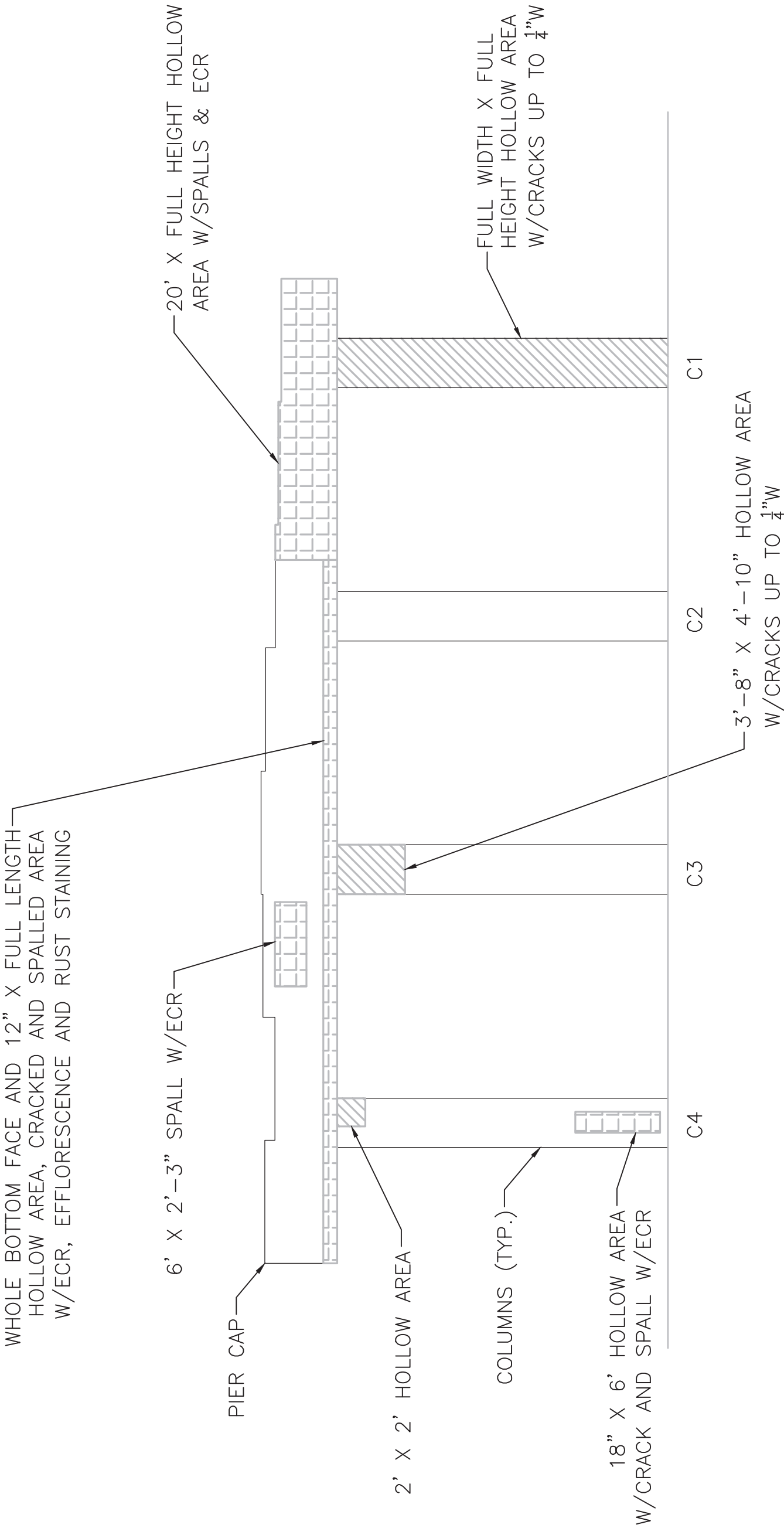
I-495 AT ST105 & MBTAMACRR

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MA	NFA	7	28
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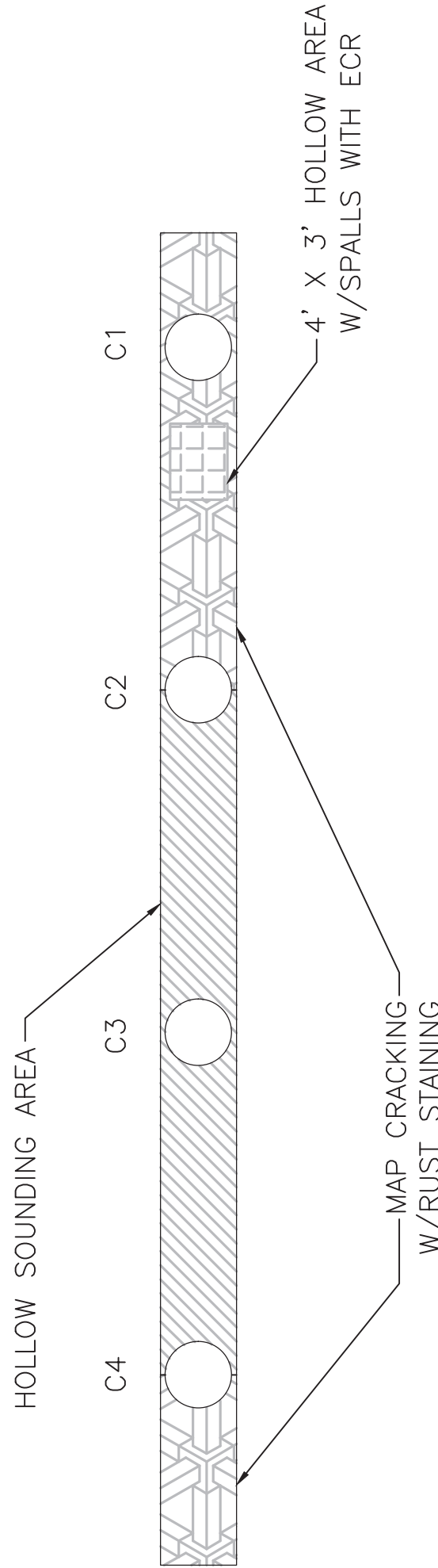
PIER ELEVATIONS (4 OF 4)



SOUTH PIER: EAST ELEVATION
SCALE: 1/8" = 1'-0"

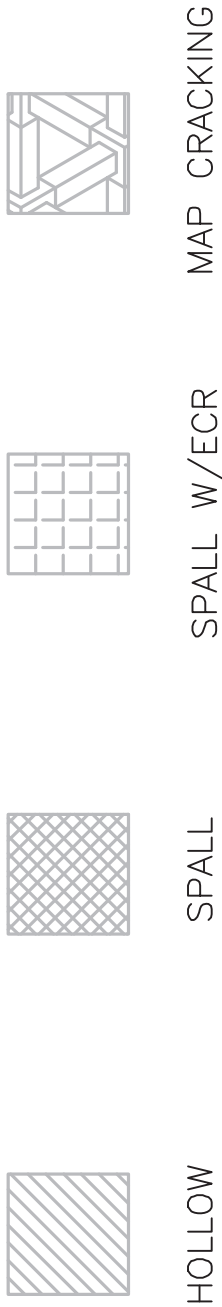


SOUTH PIER: WEST ELEVATION
SCALE: 1/8" = 1'-0"



SOUTH PIER: BOTTOM FACE
SCALE: 1/8" = 1'-0"

LEGEND



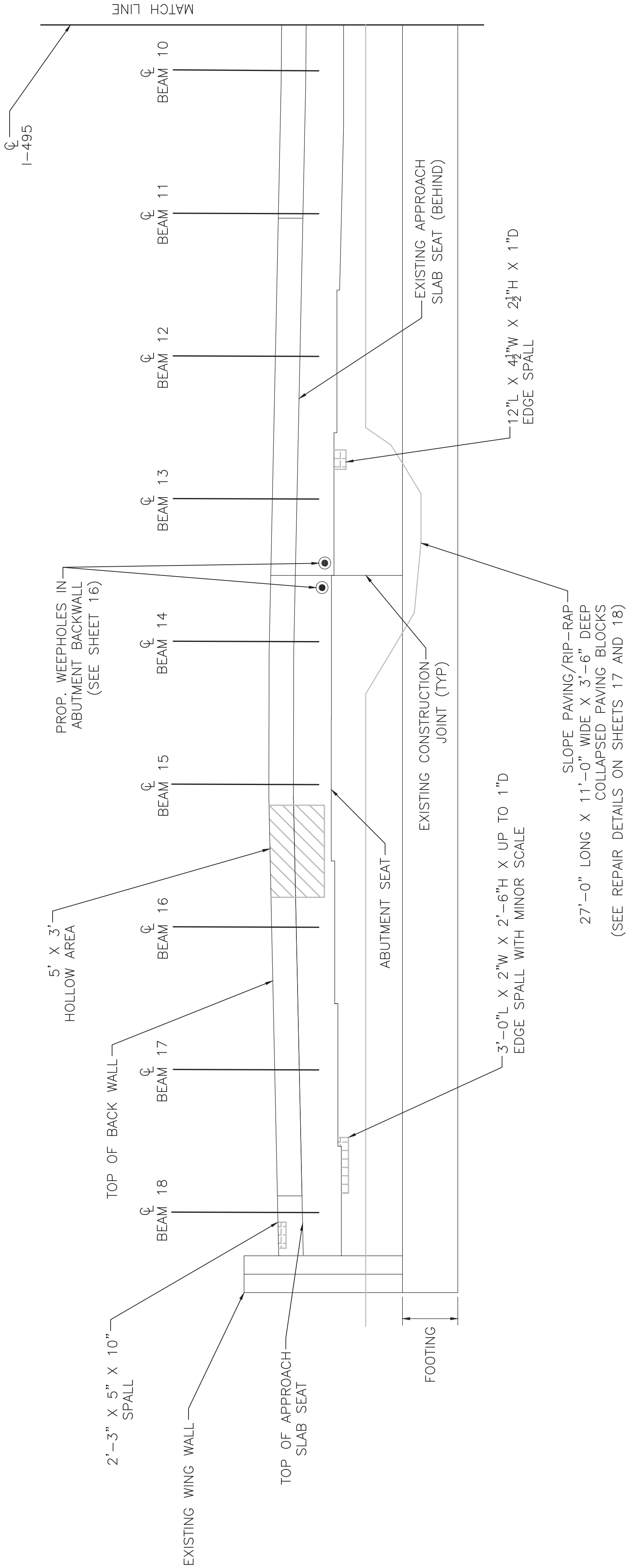
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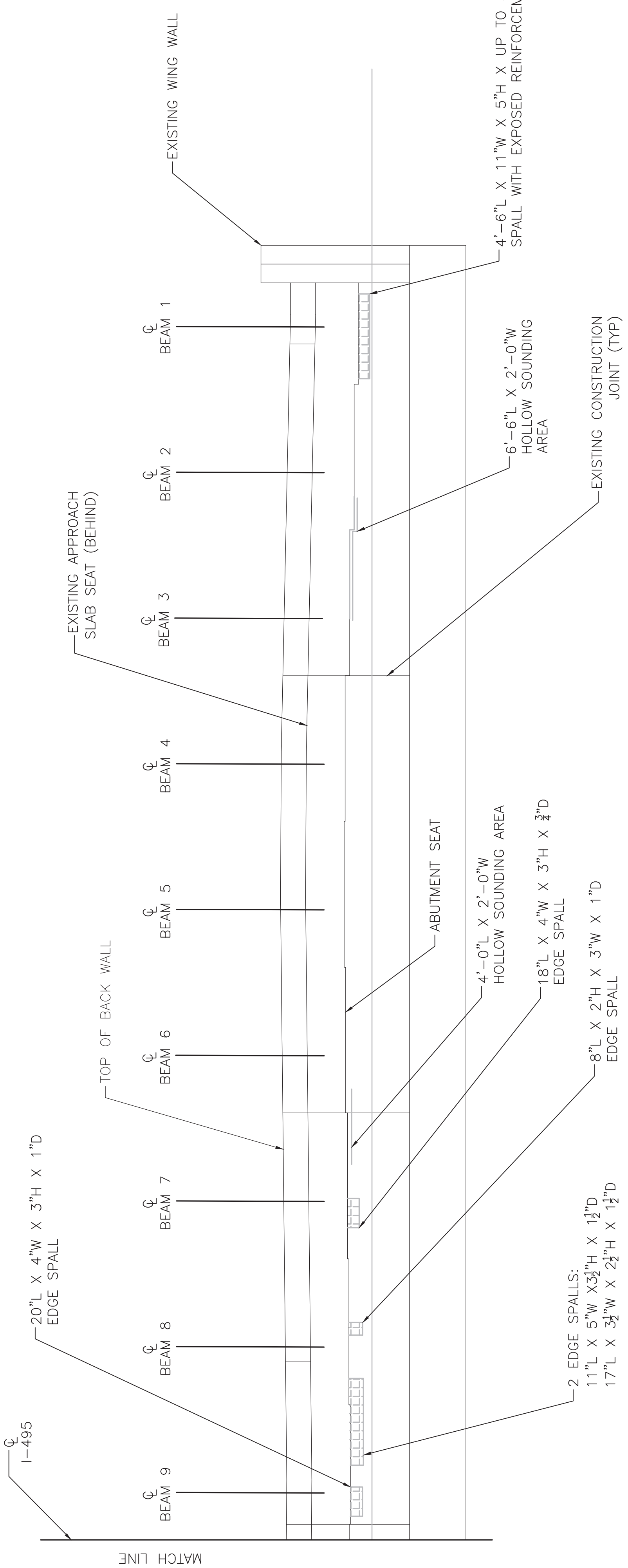
MIDDLEBOROUGH			
I-495 AT ST105 & MBTAMACRR			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	8	28
PROJECT FILE NO. 612743			

ABUTMENT ELEVATIONS (1 OF 2)



EAST ABUTMENT: ELEVATION

SCALE: 1/4" = 1'-0"



EAST ABUTMENT: ELEVATION

SCALE: 1/4" = 1'-0"

LEGEND

	HOLLOW		SPALL		SPALL W/ECR		MAP CRACKING
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ECR = EXPOSED AND CORRODED REINFORCEMENT

CORNER SPALL DIMENSIONS

LENGTH = HORIZONTAL ON FRONT FACE AND TOP FACE

HEIGHT = VERTICAL ON FRONT FACE

WIDTH = PERPENDICULAR TO FRONT FACE ON TOP FACE

DEPTH = INTO THE FRONT AND TOP FACES

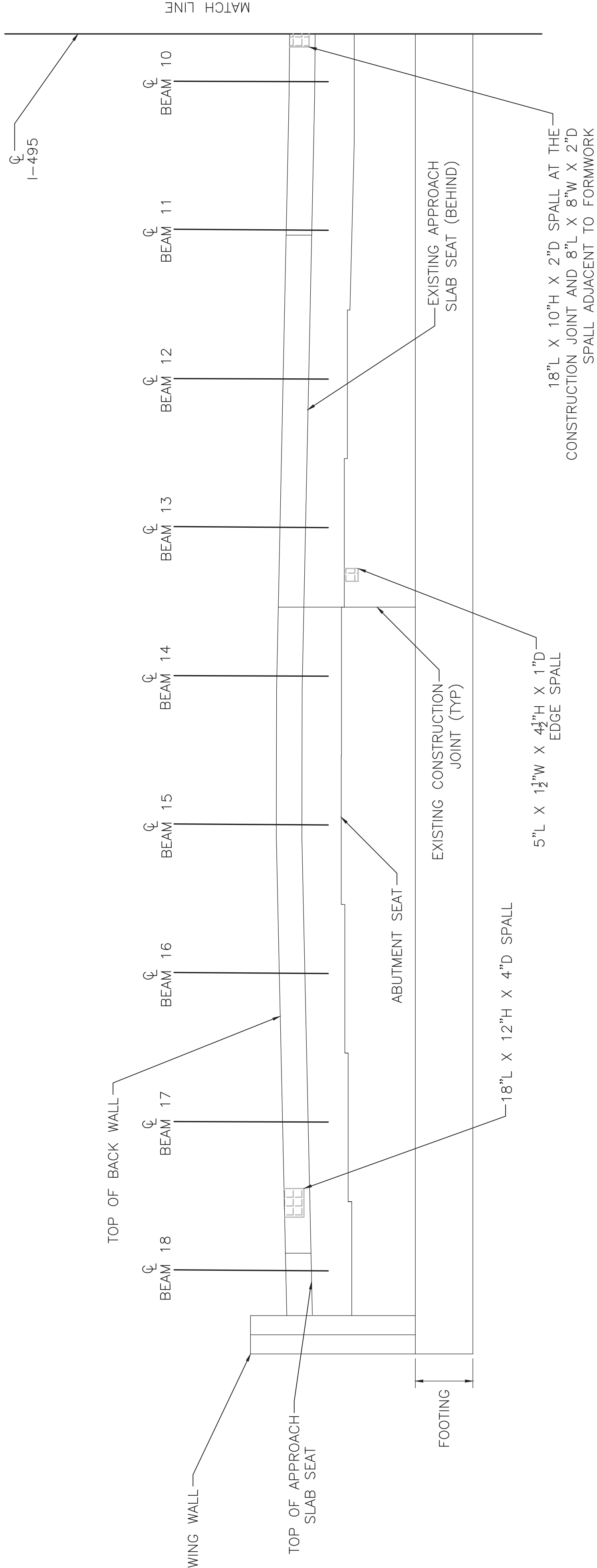
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4. ALL CONCRETE SURFACES ARE TO BE COATED UNDER ITEM 964.21. APPROXIMATE AREA 2,908 SF.

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MIDDLEBOROUGH			
I-495 AT ST105 & MBTAMACRR			
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MA	NFA	9	28
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ABUTMENT ELEVATIONS (2 OF 2)



WEST ABUTMENT: ELEVATION
SCALE: 1/4" = 1'-0"

LEGEND

	HOLLOW		SPALL		SPALL W/ECR		MAP CRACKING
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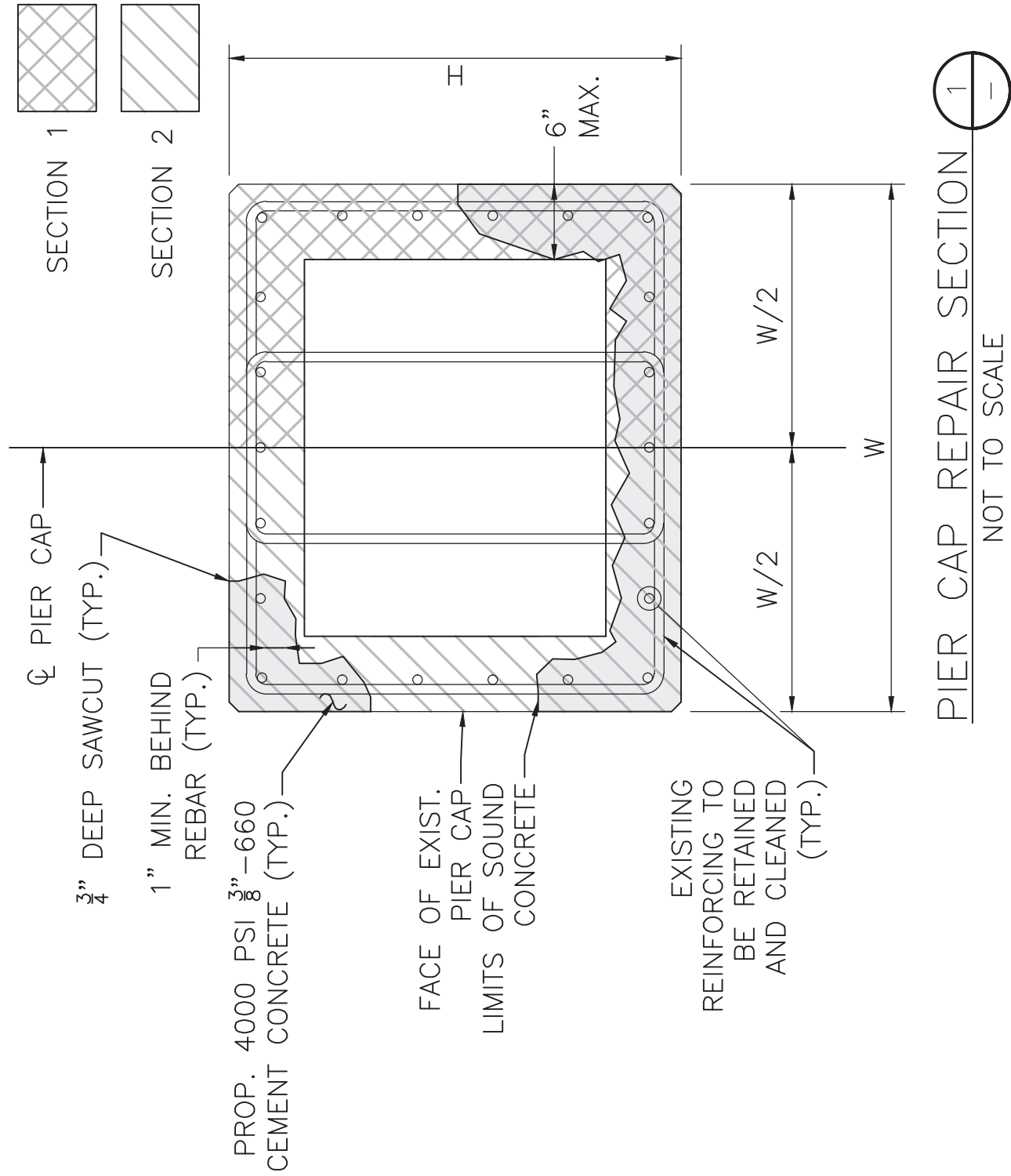
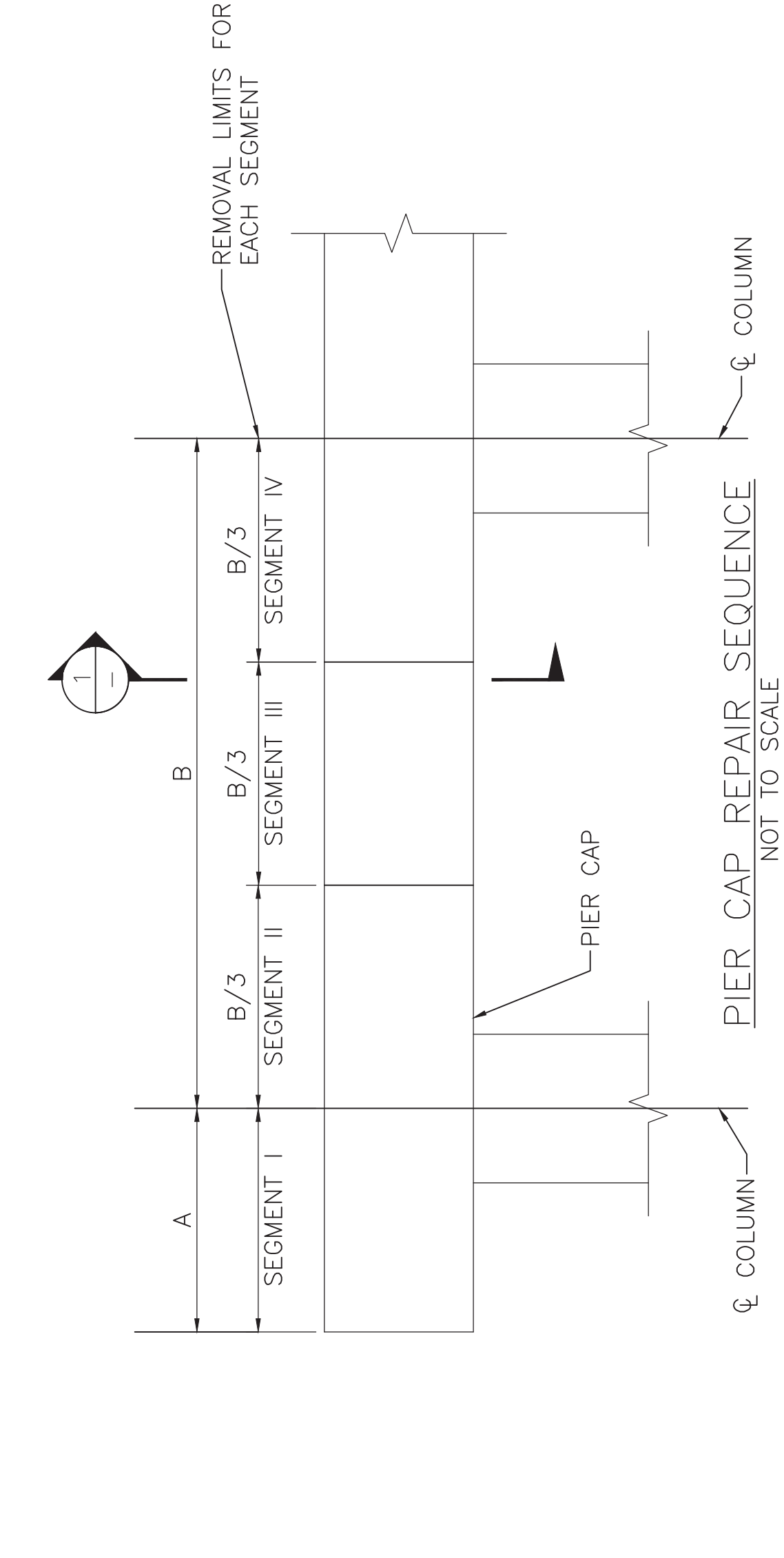
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WEST ABUTMENT: ELEVATION
SCALE: 1/4" = 1'-0"



REINFORCEMENT:
REINFORCING STEEL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS,
ALL BARS SHALL BE LAPPED AS FOLLOWS.

MODIFICATION	CONDITION	#4	BARS	#5	BARS	#6	BARS	#7	BARS	#8	BARS	#9	BARS	#10	BARS	#11	BARS
1.	NONE	16"	19"	19"	23"	23"	33"	33"	38"	43"	43"	49"	49"	60"	60"	60"	60"
2.	12" OF CONCRETE BELOW BAR	20"	25"	25"	30"	30"	43"	43"	49"	56"	56"	64"	64"	78"	78"	78"	78"
3.	COATED BARS COVER <3db OR CLEAR SPACING <6db	23"	29"	29"	34"	34"	50"	50"	57"	64"	64"	74"	74"	89"	89"	89"	89"
4.	COATED BARS, ALL OTHER CASES	18"	23"	23"	27"	27"	40"	40"	46"	51"	51"	59"	59"	72"	72"	72"	72"
5.	CONDITION 2. AND 3.	26"	32"	32"	39"	39"	56"	56"	64"	72"	72"	83"	83"	102"	102"	102"	102"
6.	CONDITION 2. AND 4.	24"	30"	30"	36"	36"	52"	52"	59"	66"	66"	76"	76"	93"	93"	93"	93"

IF ABOVE BARS ARE SPACED 6" OR MORE ON CENTER, THE LAP LENGTH SHALL BE 80% OF THE LAP LENGTH GIVEN ABOVE. ALL OTHER BARS
SHALL BE LAPPED AS SHOWN ON THE CONTRACT DRAWINGS.

EPOXY COATING:

ALL REINFORCING BARS AND SUPPORT DEVICES SHALL BE EPOXY COATED IN ACCORDANCE WITH AASHTO M 284

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CONCRETE REPAIR DETAILS (1 OF 2)

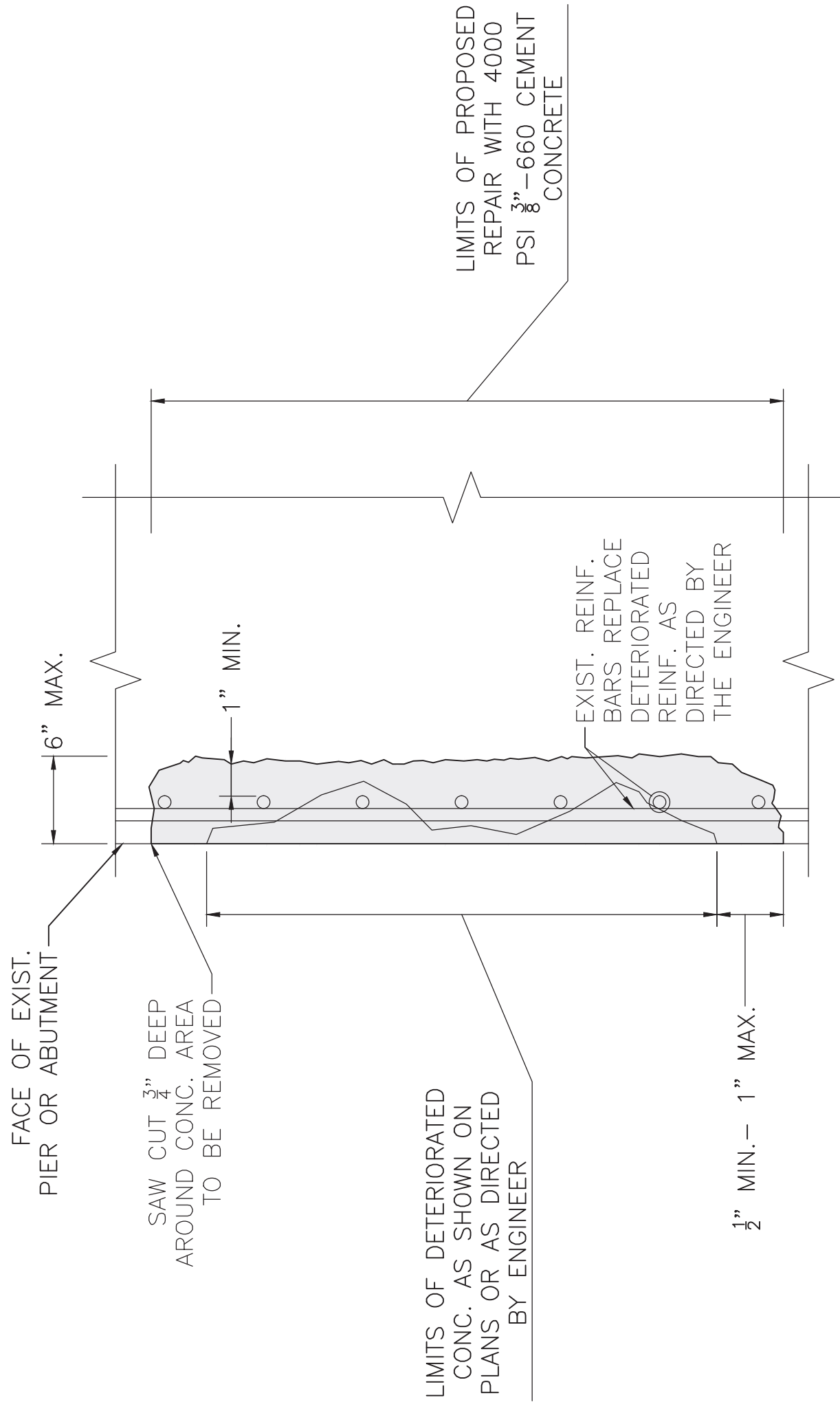
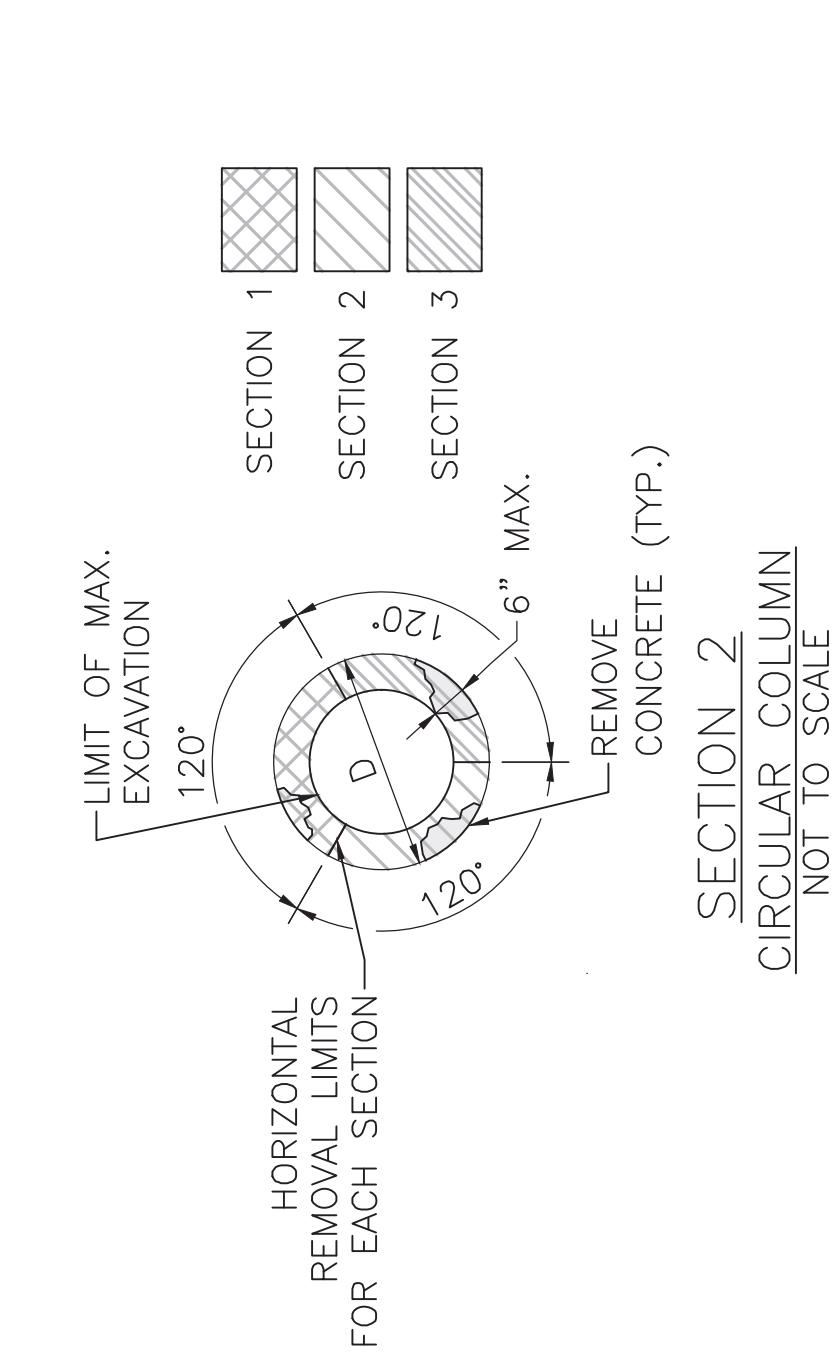
CONCRETE REPAIR NOTES:

- CONTRACTOR TO CLEAN ABUTMENTS AND PIER CAPS FROM OIL, GREASE, DIRT, SALT AND BIRD GUANO. SPALLED CONCRETE AND OTHER DEBRIS BEFORE PERFORMING CONCRETE REPAIRS.
- CONCRETE ELEMENTS ARE DIVIDED INTO SEGMENTS. WORK TO BE PERFORMED ON SECTIONS AS SHOWN.
- THE CONTRACTOR SHALL PROVIDE A TEMPORARY SHORING SYSTEM TO SUPPORT THE BEAM DEAD AND LIVE LOADS IF THE EXCAVATION IS WITHIN 6" OF THE BEARINGS.
- CONTRACTOR SHALL STAGE THE WORK SO THAT THE SECTIONS IN POOREST CONDITION ARE REPAIRED FIRST, AS APPROVED BY THE ENGINEER.
- CONTRACTOR SHALL NOT WORK ON ADJACENT SECTIONS SIMULTANEOUSLY UNLESS APPROVED BY THE DISTRICT BRIDGE ENGINEER.
- CONTRACTOR SHALL WAIT 72 HOURS AFTER COMPLETING REPAIRS TO A SECTION BEFORE REPAIRS TO ADJACENT SECTIONS, HOWEVER HE/SHE MAY PERFORM WORK ON OTHER BRIDGE ELEMENTS.
- CONTRACTOR SHALL STOP REMOVING DETERIORATING CONCRETE WHEN A MAXIMUM DEPTH OF 6 IN. IS REACHED. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED IF MORE REMOVAL SEEMS NECESSARY ON THE BRIDGE SECTION.
- EXISTING REINFORCING NOT SHOWN.
- WHERE IDENTIFIED IN THE FIELD, THE USE OF MECHANICAL COUPLES FOR SPLICING AND REPAIRING REINFORCEMENT SHALL BE APPROVED BY THE ENGINEER. WHERE LAP LENGTHS EXCEED LIMITS OF DETERIORATED CONCRETE MECHANICAL SPLICES SHALL BE USED UNLESS WAIVED BY THE ENGINEER.
- THE CONTRACTOR SHALL SUBMIT AN ALTERNATE REPAIR SEQUENCE FOR APPROVAL OF THE ENGINEER WHEN TEMPORARY SHORING IS UTILIZED DURING REPAIRS.
- MAXIMUM SEGMENT LENGTH SHALL BE LIMITED TO 8 FEET.

SURFACE PREPARATION FOR CONCRETE REPAIR NOTES:

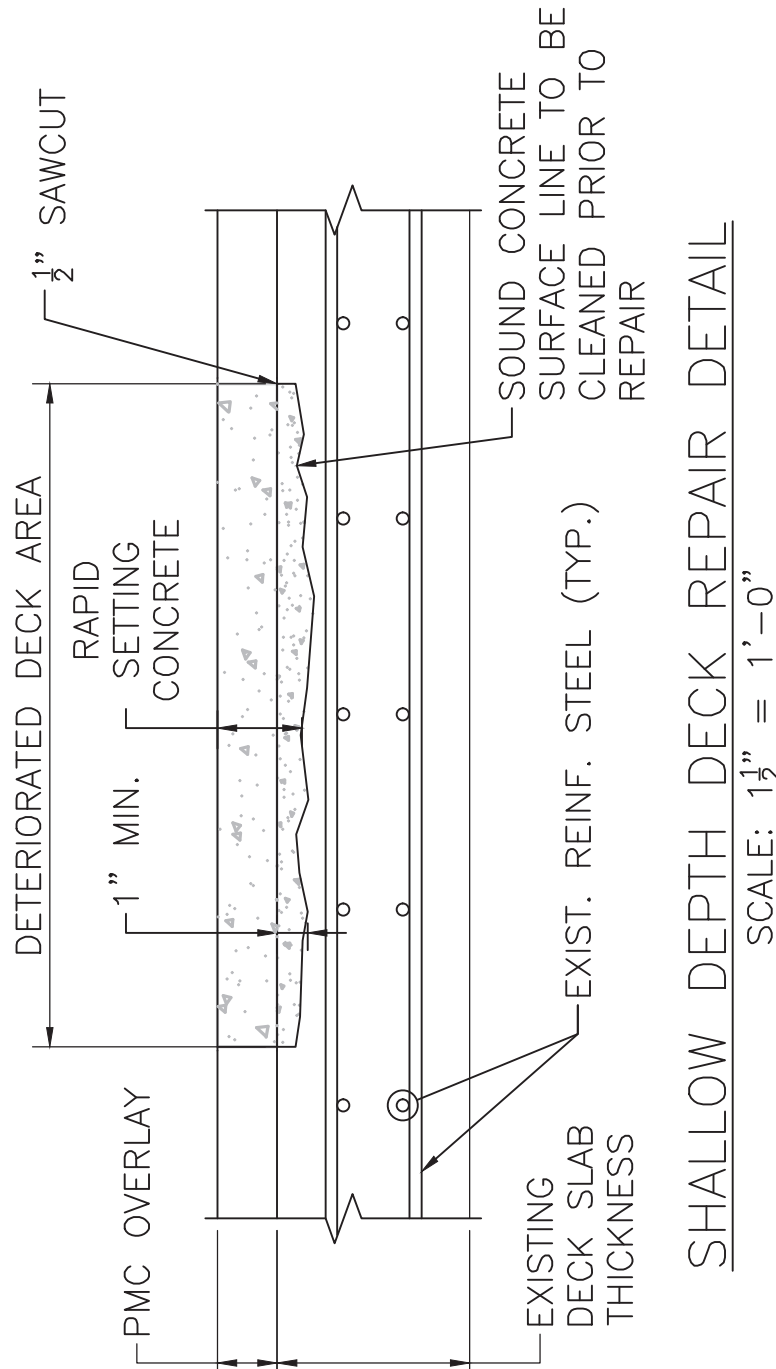
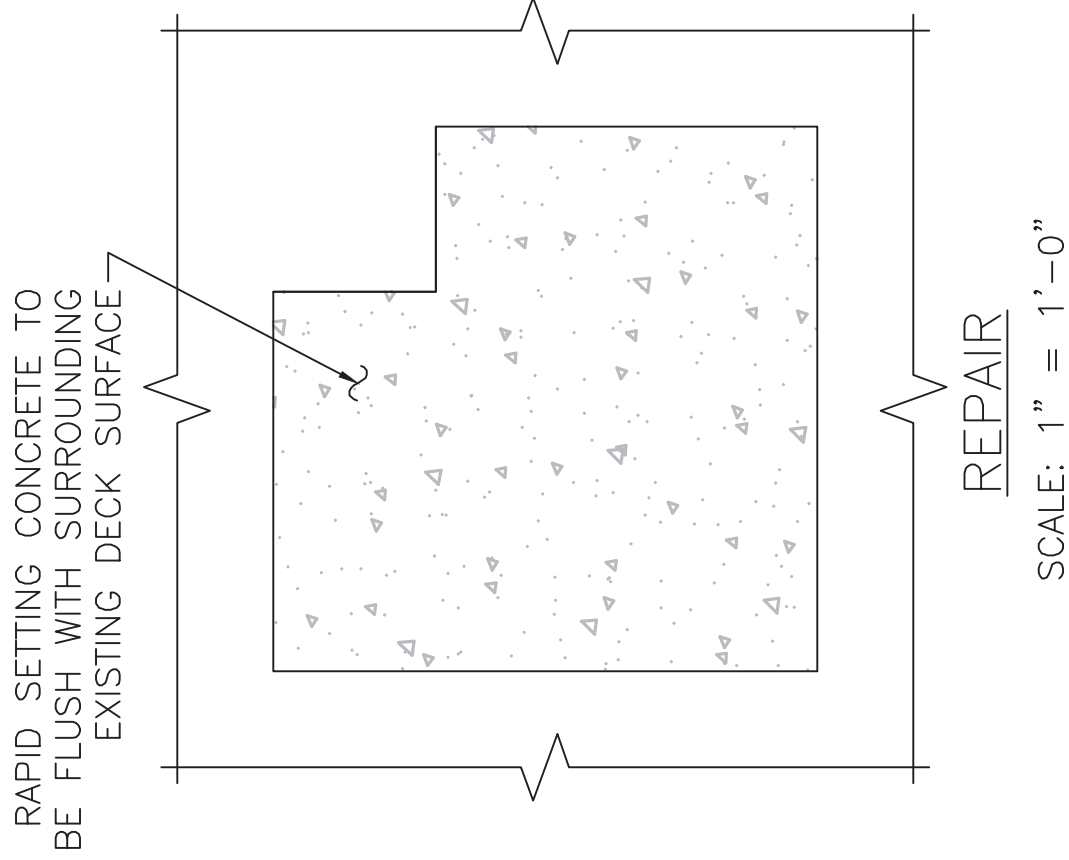
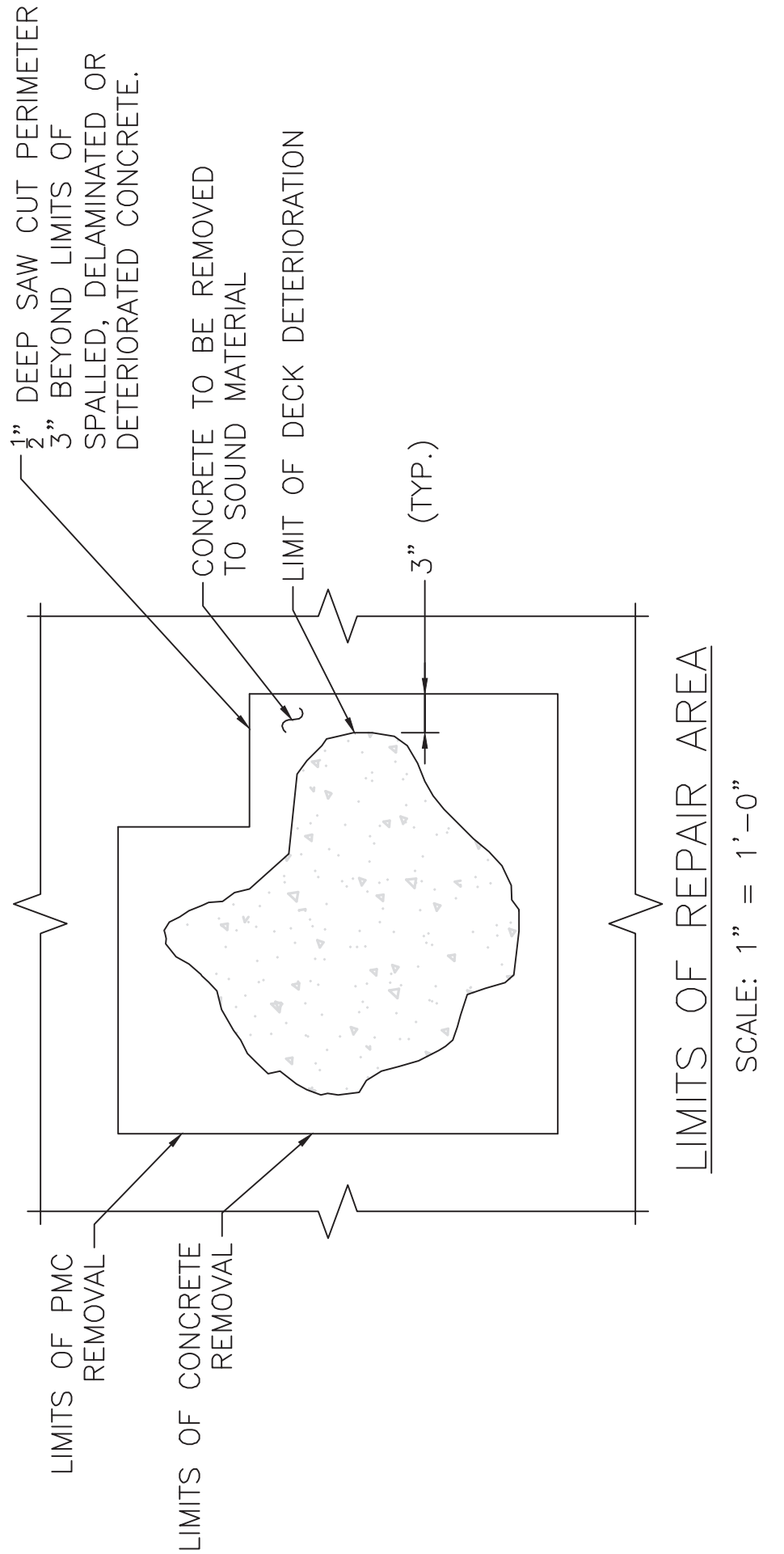
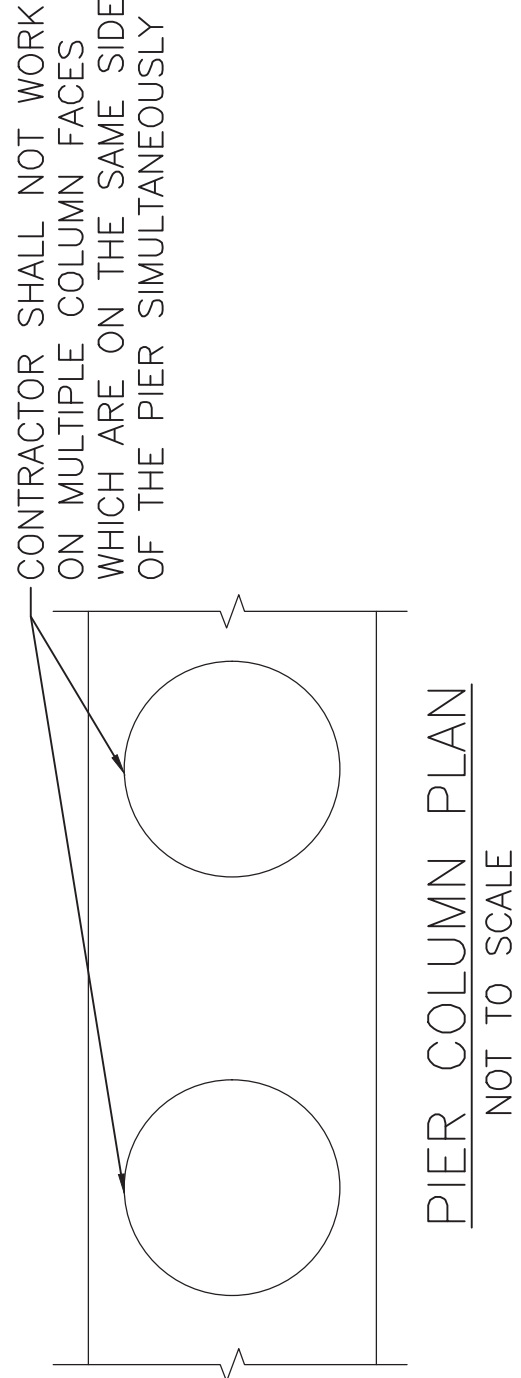
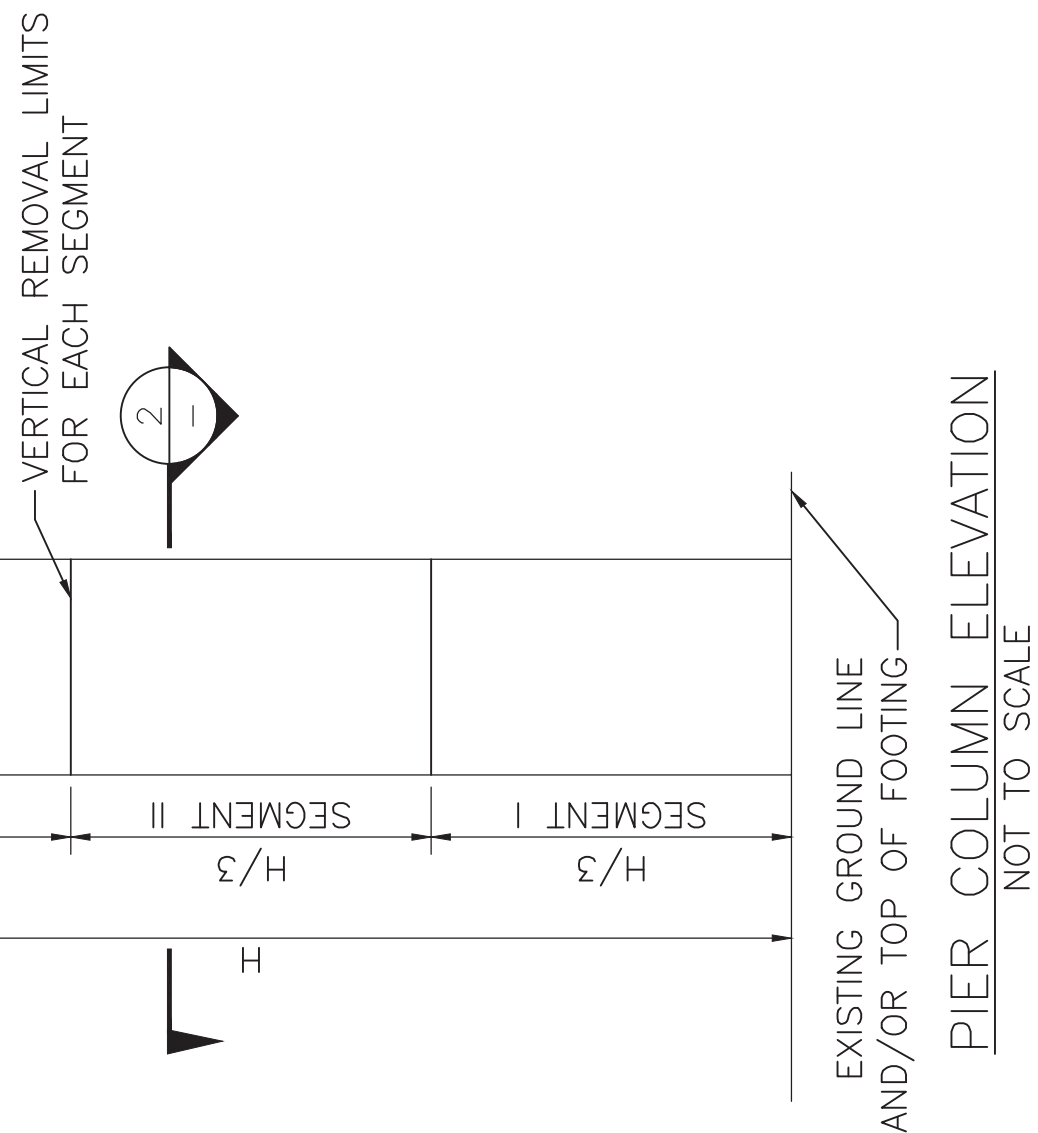
- EXTENT, LOCATION, AND REPAIR TYPE OF ALL CONCRETE REPAIRS TO BE FIELD VERIFIED AND APPROVED BY THE ENGINEER AFTER CONTRACTOR HAS SOUNDED AND MARKED OUT ALL REPAIR AREAS. REPAIR CONFIGURATIONS SHOULD BE KEPT AS SIMPLE AS POSSIBLE, PREFERABLY WITH SQUARE CORNERS.
- SAW CUT ALONG NEAT LINES AROUND REPAIR AREA PRIOR TO CONCRETE EXCAVATION. USE SAW CUT DEPTH OF 4" SAW CUT ALONG NEAT LINES AROUND REPAIR AREA PRIOR TO CONCRETE EXCAVATION. USE SAW CUT DEPTH OF 3" OR LESS AS REQUIRED TO AVOID CUTTING REINFORCING STEEL (REFER TO SPECIAL PROVISIONS).
- REMOVE DETERIORATED AND DELAMINATED CONCRETE, UNDERCUT EXPOSED REINFORCING STEEL TO PROVIDE 1" MINIMUM CLEARANCE AROUND BARS REMOVE ADDITIONAL CONCRETE AS REQUIRED TO PROVIDE MINIMUM REQUIRED THICKNESS OF REPAIR MATERIAL. NOTE: IF REINFORCING BARS ARE NOT EXPOSED AFTER REMOVING DETERIORATED CONCRETE, REPAIR USING CEMENTITIOUS MORTAR.
- IF REINFORCING STEEL IS EXPOSED, CLEAN BY MECHANICAL MEANS AND HIGH PRESSURE WASHING WITH WATER THAT CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. WHERE ACTIVE CORROSION HAS OCCURRED THAT WOULD INHIBIT BONDING, ABRASIVE BLAST STEEL TO NEAR WHITE METAL (SSPC-SP10) AND PAINT WITH AN EPOXY COATING CONFORMING TO MASSDOT STANDARD SPECIFICATIONS M8.01.7.
- AFTER PATCH REMOVALS AND EDGE PREPARATIONS ARE COMPLETE, REMOVE BOND INHIBITING MATERIALS (DIRT, GREASE, LOOSELY BONDED AGGREGATE) BY ABRASIVE BLASTING (SP5) OR HIGH PRESSURE WATER BLASTING WITH WATER THAT CONTAINS NO DETERGENTS OR BOND INHIBITING CHEMICALS. CHECK THE CONCRETE SURFACES AFTER CLEANING TO INSURE THAT SURFACE IS FREE FROM ADDITIONAL LOOSE AGGREGATE OR THAT ADDITIONAL DELAMINATIONS ARE NOT PRESENT.
- THOROUGHLY PRE-WET CONCRETE REPAIR AREA FOR 24 HOURS PRIOR TO REPAIR CONCRETE PLACEMENT. SUBSTRATE SHALL BE SATURATED SURFACE DRY (SSD) WITH NO STANDING WATER AT TIME OF REPAIR CONCRETE PLACEMENT.
- PLACEMENT AND SUBSEQUENT CURING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS PLACEMENT AND SUBSEQUENT CURING SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE SPECIAL PROVISIONS.
- ALL SURFACES SHALL BE PATCHED AND RUBBED TO PRODUCE A SMOOTH FINISH.

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PARTIAL DEPTH REPAIR

NOT TO SCALE



- PIER COLUMN REPAIR SEQUENCE NOTES:
- CONCRETE ELEMENTS ARE DIVIDED INTO SEGMENTS. WORK TO BE PERFORMED ON SECTIONS AS DEFINED BELOW.
 - NOTE CONTRACTOR SHALL STAGE THE WORK SO THAT THE WORSE SECTIONS ARE REPAIRED FIRST.
 - CONTRACTOR SHALL NOT WORK ON MORE THAN TWO NON-ADJACENT SECTIONS SIMULTANEOUSLY UNLESS APPROVED BY THE DISTRICT BRIDGE ENGINEER.
 - CONTRACTOR SHALL WAIT 72 HOURS AFTER COMPLETING REPAIRS TO A SECTION BEFORE CHIPPING ADJACENT SECTIONS, HOWEVER HE/SHE MAY PERFORM WORK ON OTHER BRIDGE ELEMENTS.
 - CONTRACTOR SHALL STOP REMOVING DETERIORATING CONCRETE WHEN A MAXIMUM DEPTH OF 6 IN. IS REACHED. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED IF MORE REMOVAL SEEMS NECESSARY.
 - EXISTING REINFORCING NOT SHOWN.
 - THE CONTRACTOR SHALL SUBMIT AN ALTERNATE REPAIR SEQUENCE FOR APPROVAL OF THE ENGINEER WHEN TEMPORARY SHORING IS UTILIZED DURING REPAIRS.
 - WHEN HEIGHT OF COLUMN IS MORE THAN 18 FEET, THE CONTRACTOR WILL BE RESTRICTED TO 6 FOOT SEGMENTS.

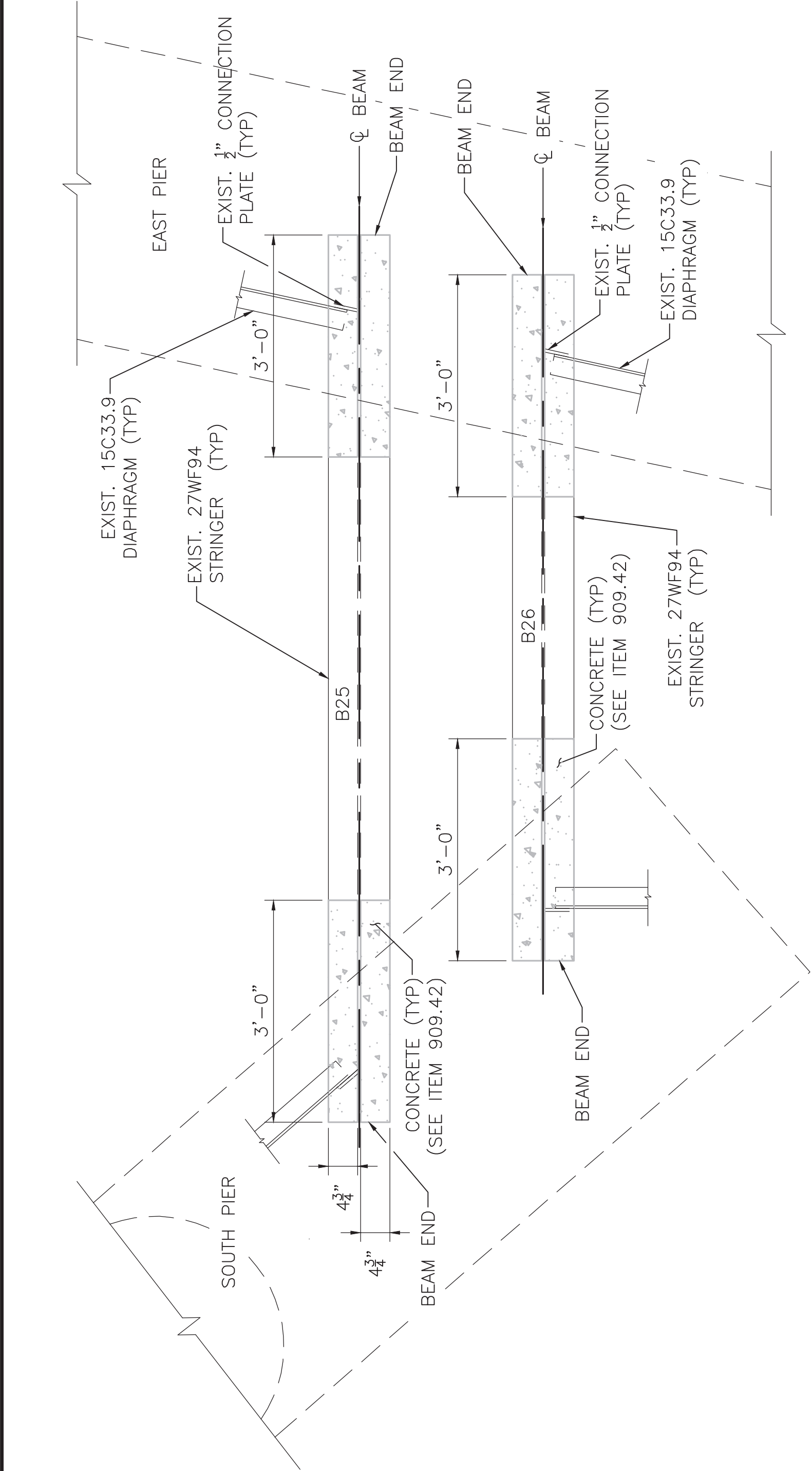
BRIDGE DECK REPAIR SEQUENCE NOTES:

- REMOVE THE DETERIORATED EXISTING PMC OVERLAY FROM THE BRIDGE DECK AREAS TO THE LIMITS DIRECTED BY THE ENGINEER. THE PERIMETERS OF THE EXCAVATED AREAS SHALL BE SAWCUT PRIOR TO PMC OVERLAY REMOVAL. THE SHAPE OF THE EXCAVATED AREAS SHALL BE RECTANGULAR WITH SQUARE CORNERS. THE PMC OVERLAY ABOVE THE CONCRETE EXCAVATION AREAS SHALL BE CONSIDERED INCIDENTAL TO THE CONCRETE EXCAVATION.
- EXCAVATE EXISTING TEMPORARY DECK REPAIR MATERIAL AND/OR DETERIORATED CONCRETE (FULL OR PARTIAL DEPTH) TO THE LIMITS DIRECTED BY THE ENGINEER. CLEAN AND RE-TIE THE EXPOSED STEEL REINFORCEMENT IF NEEDED AS DIRECTED BY THE ENGINEER.
- INSTALL NEW STEEL REINFORCEMENT AS DIRECTED BY THE ENGINEER, IF NEEDED.
- MIX AND PLACE RAPID SETTING CONCRETE IN THE EXCAVATED AREAS. THE TOP SURFACE OF THE RAPID SETTING CONCRETE SHALL BE FLUSH WITH THE SURROUNDING EXISTING DECK SURFACE.
- AFTER THE RAPID SETTING IS SUFFICIENTLY CURED. OPEN ROAD TO TRAFFIC.

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MA	NFA	11	28
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CONCRETE REPAIR DETAILS (2 OF 2)

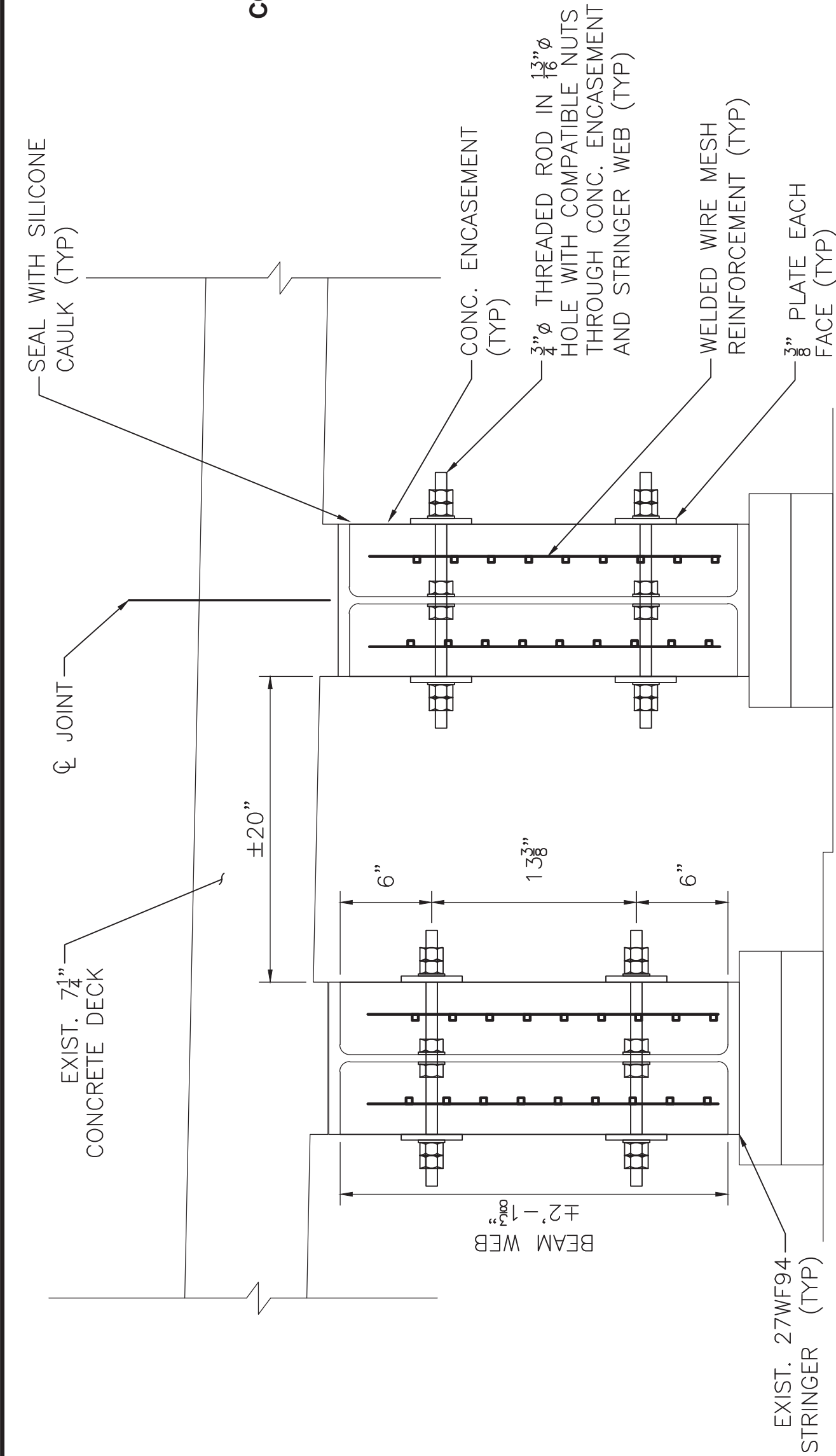
9/16/2023	ISSUED FOR CONSTRUCTION
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USE ONLY PRINTS OF LATEST DATE	



CONCRETE BEAM ENCASEMENT: PLAN

SCALE: 3/4" = 1'-0"

NOTE:
BEAMS B25 AND B26 IN SPAN 2 ARE SHOWN. BEAMS B25 & B26 IN SPAN 2A ARE SIMILAR BUT MIRRORED ABOUT CL OF BEAM B26.

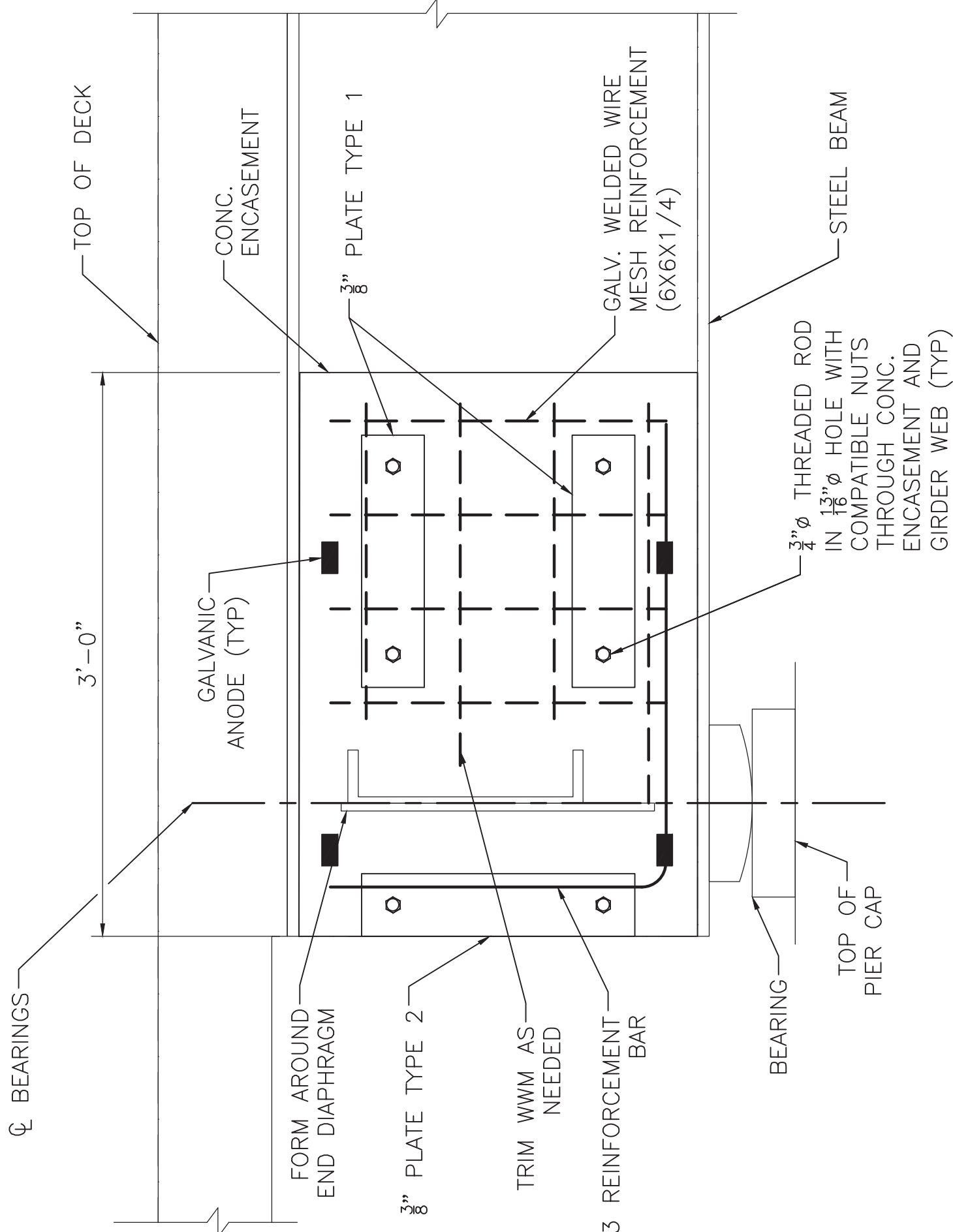


SECTION 3

SCALE: 1 1/2" = 1'-0"

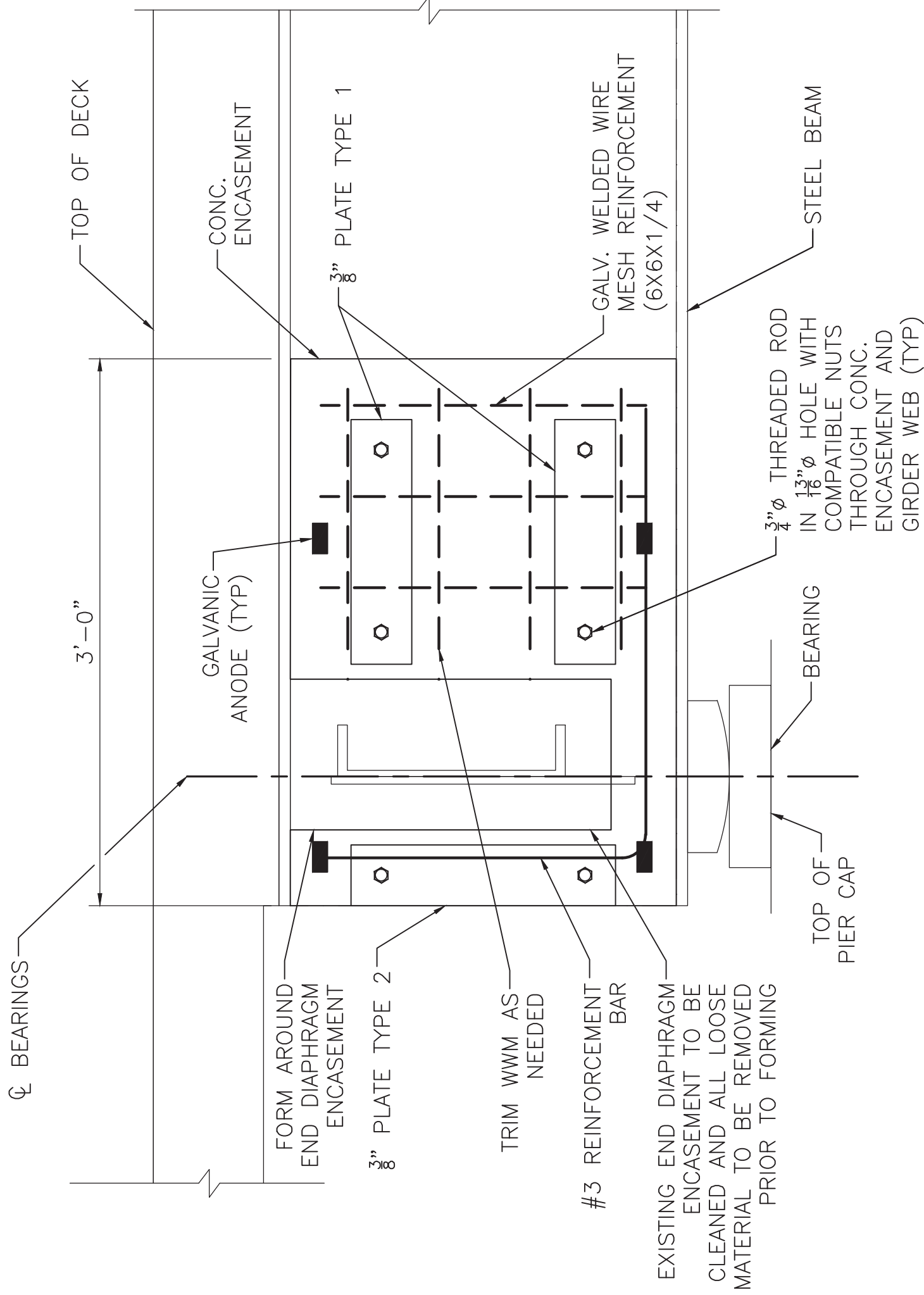
BEAM END ENCASEMENT TYPE											
SPAN 2											
BEAM 25			BEAM 26								
SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER
NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE
C	B	C	B	A	C	B	A	C	B	C	A

SPAN 2A											
BEAM 25			BEAM 26								
SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER	SOUTH PIER	EAST PIER
NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE	NORTH FACE	SOUTH FACE
C	B	C	B	C	B	C	B	C	B	C	A



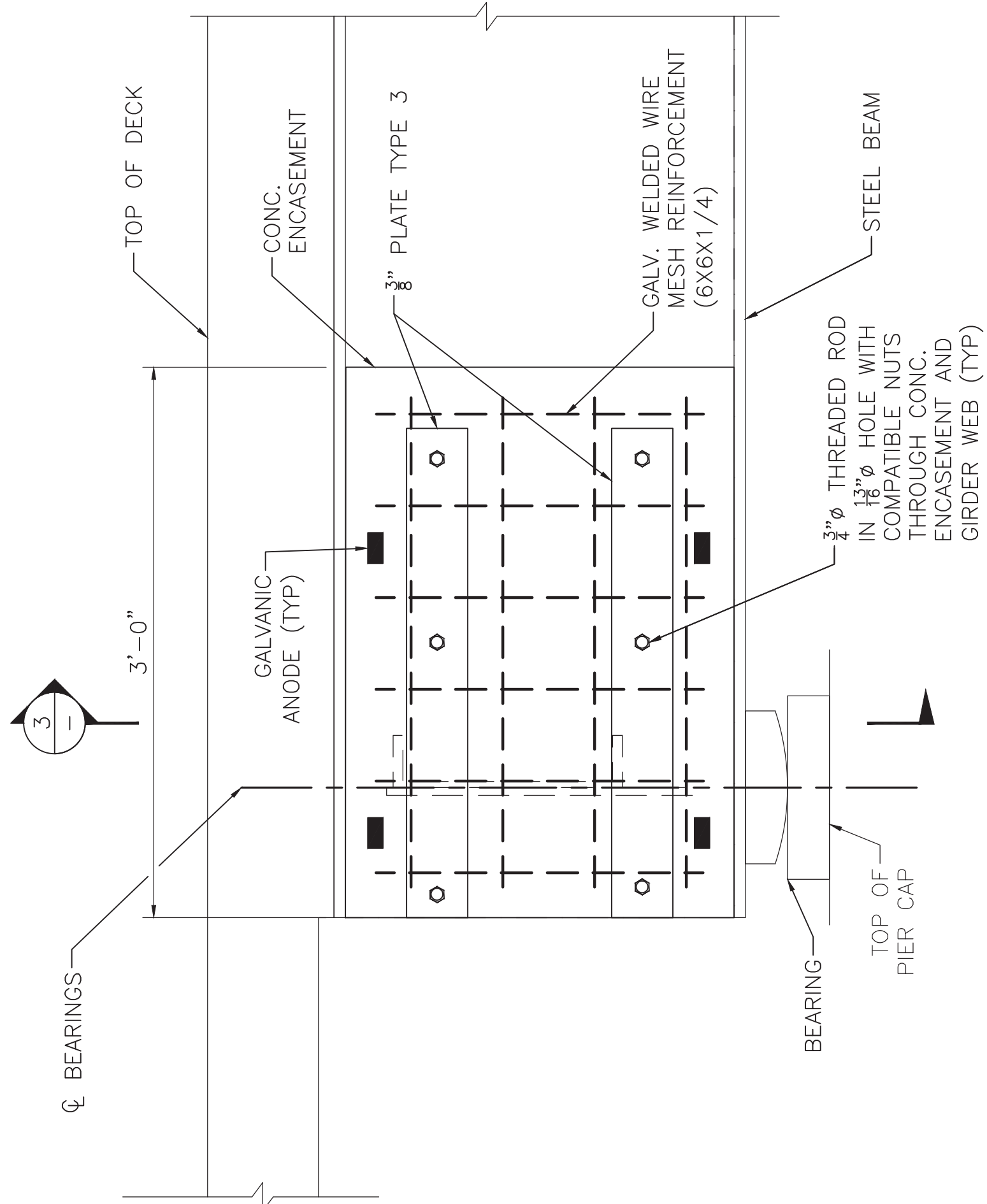
BEAM END CONCRETE ENCASEMENT: ELEVATION TYPE A

SCALE: 1 1/2" = 1'-0"



BEAM END CONCRETE ENCASEMENT: ELEVATION TYPE B

SCALE: 1 1/2" = 1'-0"



BEAM END CONCRETE ENCASEMENT: ELEVATION TYPE C

SCALE: 1 1/2" = 1'-0"

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MA	NFA	12	28
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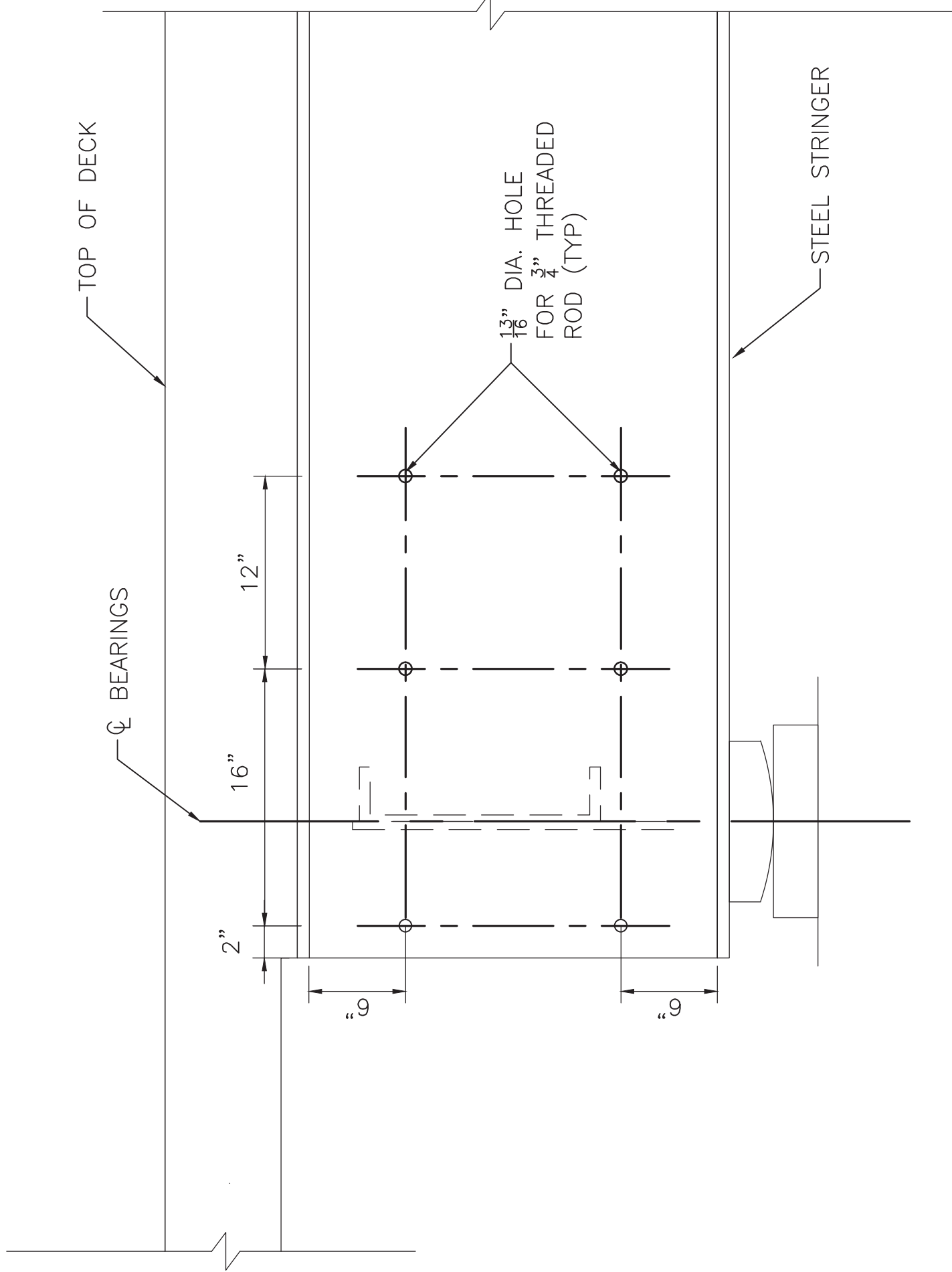
CONCRETE BEAM ENCASEMENT DETAILS (1 OF 2)

MIDDLEBOROUGH

I-495 AT ST105 & MBTAMACRR

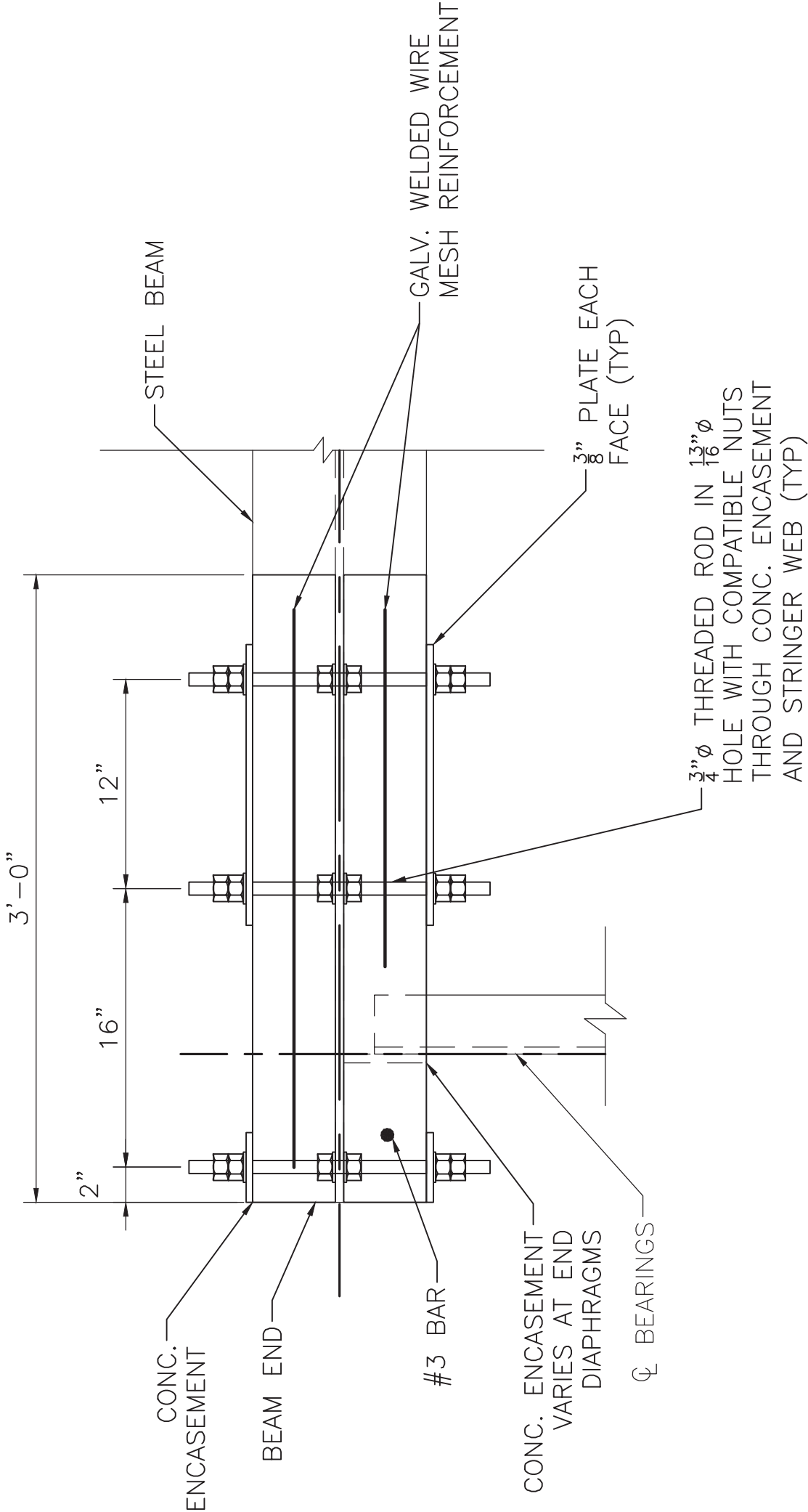
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	13	28
PROJECT FILE NO.		612743	

CONCRETE BEAM ENCASEMENT DETAILS (2 OF 2)



TYPICAL END BEAM DRILL HOLE LOCATIONS BEAMS
B25 AND B26 AT BOTH ENDS

SCALE: 1 1/2" = 1'-0"



CONCRETE BEAM ENCASEMENT: PLAN

SCALE: 1 1/2" = 1'-0"

NOTE:
SOUTH PIER END SHOWN, EAST PIER SIMILAR BUT OPPOSITE.

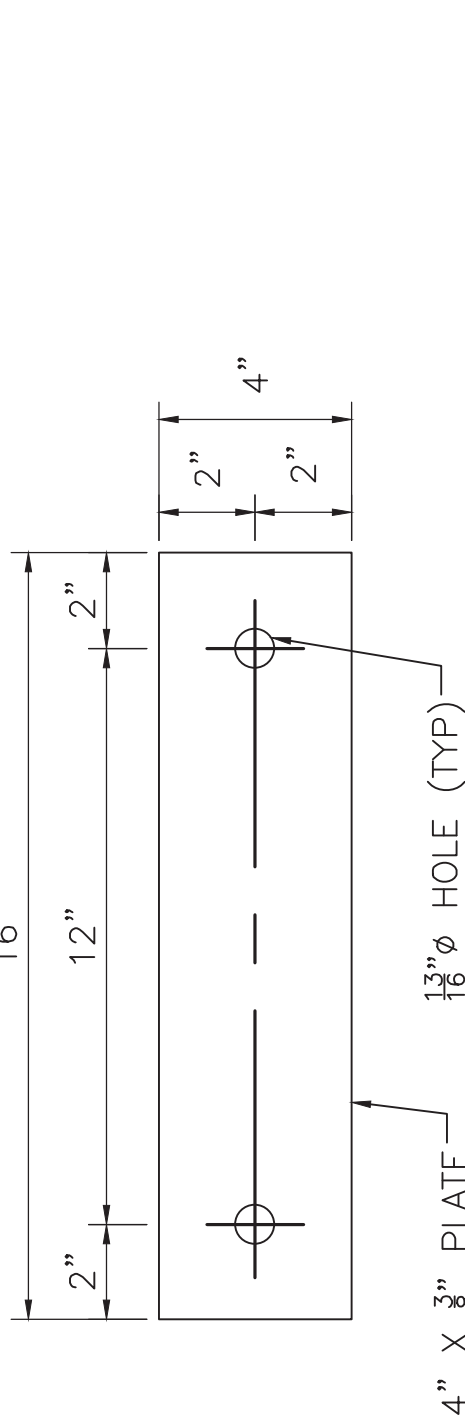


PLATE TYPE 1 DETAIL

SCALE: 3" = 1'-0"

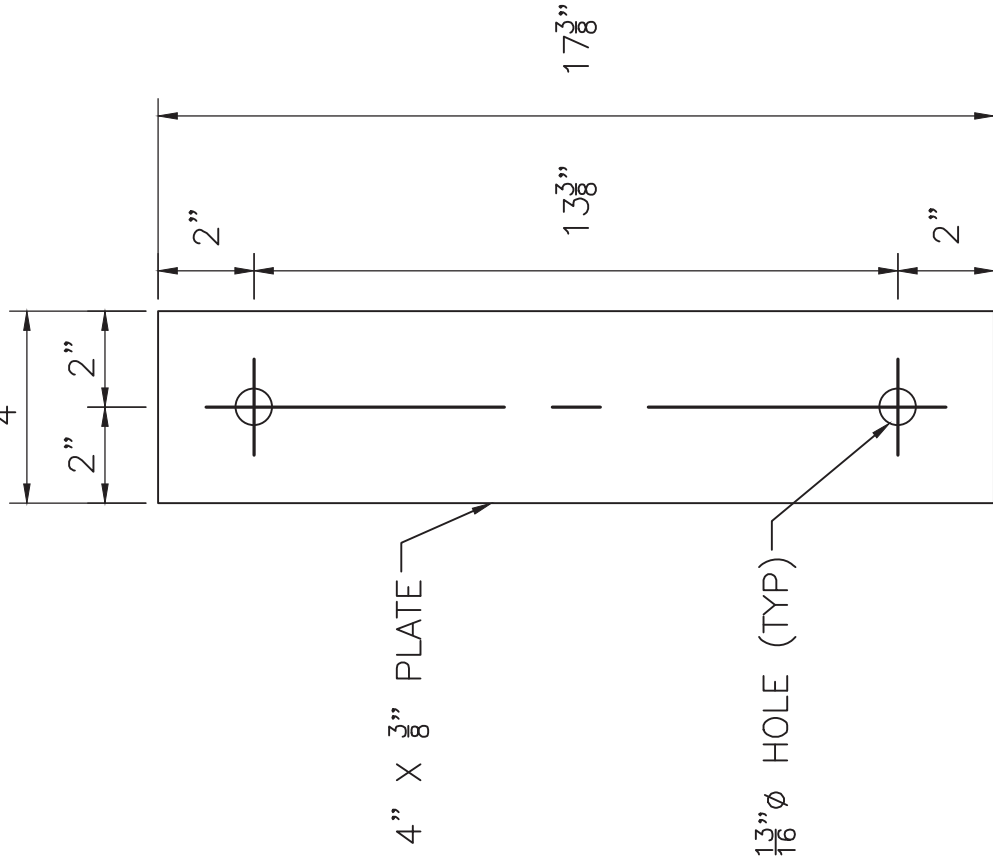


PLATE TYPE 2 DETAIL

SCALE: 3" = 1'-0"

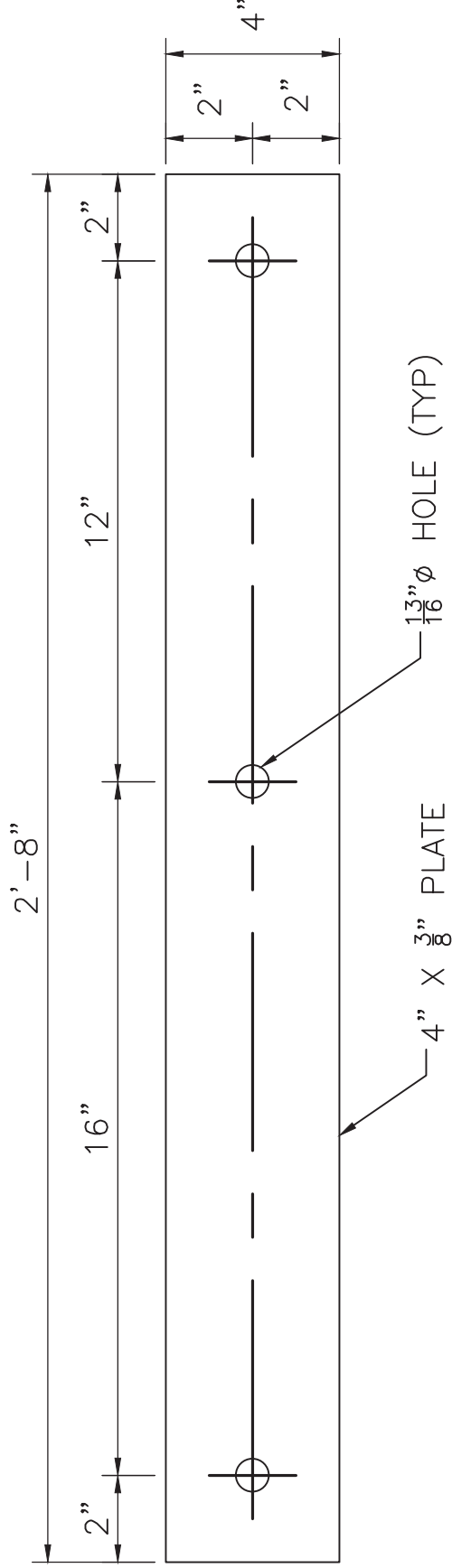


PLATE TYPE 3 DETAIL

SCALE: 3" = 1'-0"

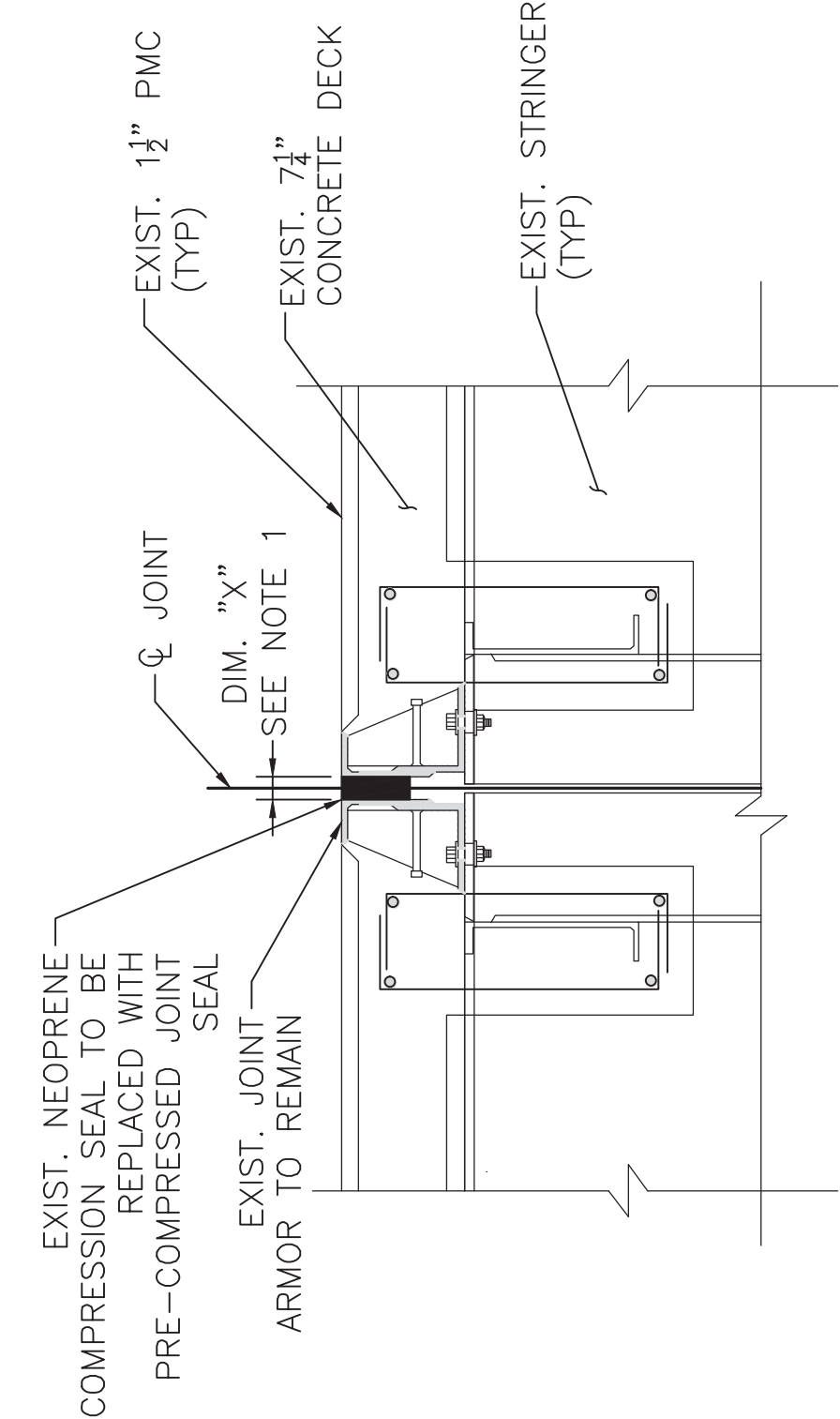
ENCASEMENT REPAIR NOTES:

1. ALL CONCRETE FOR ENCASEMENT REPAIRS SHALL BE 4000 PSI, SELF CONSOLIDATING CEMENT CONCRETE.
2. STRUCTURAL STEEL PLATES SHALL CONFORM TO AASHTO M270 (ASTM A709) GRADE 50. CVN TESTING NOT REQUIRED. PLATES SHALL BE GALVANIZED.
3. ANCHOR RODS SHALL BE FULL THREADED 3/4" IN 1 3/8" DIA HOLES AND SHALL CONFORM TO ASTM F1554 GRADE 55 GALVANIZED. NUTS AND WASHERS SHALL CONFORM TO ASTM 563 AND ASTM F436 RESPECTIVELY. ANCHOR HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION M8.04.3 OF THE 2022 MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
4. EXISTING STEEL SURFACES TO BE IN CONTACT WITH REPAIR CONCRETE SHALL BE CLEANED AND PAINTED. IF THIS IS NOT POSSIBLE THE SURFACES SHALL BE PREPARED IN ACCORDANCE WITH SSPC-SP2 HAND TOOL CLEANING AND COATED WITH TWO COATS OF ZINC RICH PRIMER.
5. ANCHOR RODS TO BE LEFT LONG ENOUGH TO ACCOMMODATE THE USE OF WOOD FORMS TO BE REMOVED AFTER CONSTRUCTION.
6. AFTER THE CONCRETE HAS CURED FOR 7 DAYS, THE WOOD FORMS SHALL BE REMOVED AND THE STEEL PLATES REINSTALLED. TWO (2) NUTS SHALL BE INSTALLED. THE FIRST NUT SHALL BE TIGHTENED TO FINGER TIGHT AND THE SECOND NUT SHALL BE FINGER TIGHT WITH AN ADDITIONAL 1/3 TURN AGAINST THE FIRST NUT.

GALVANIC ANODE NOTES:

1. ANODES SHALL BE PLACED IN THE CENTER OF THE REINFORCING GRID. TIE EACH END OF ANODE TO REINFORCING OR ACCORDING TO MANUFACTURER'S PRODUCT SPECIFICATIONS.
2. CONCRETE COVER: 1" MINIMUM.
3. TEST ANODE-TO-STEEL CONTINUITY AND STEEL-TO-STEEL CONTINUITY. RESISTIVITY SHALL NOT EXCEED 1 OHM.
4. ANODE MANUFACTURER TO RECOMMEND ANODE SPACING FOR ENCASEMENT TO CONTRACTOR FOR APPROVAL OF THE ENGINEER PRIOR TO ORDERING ANODES.

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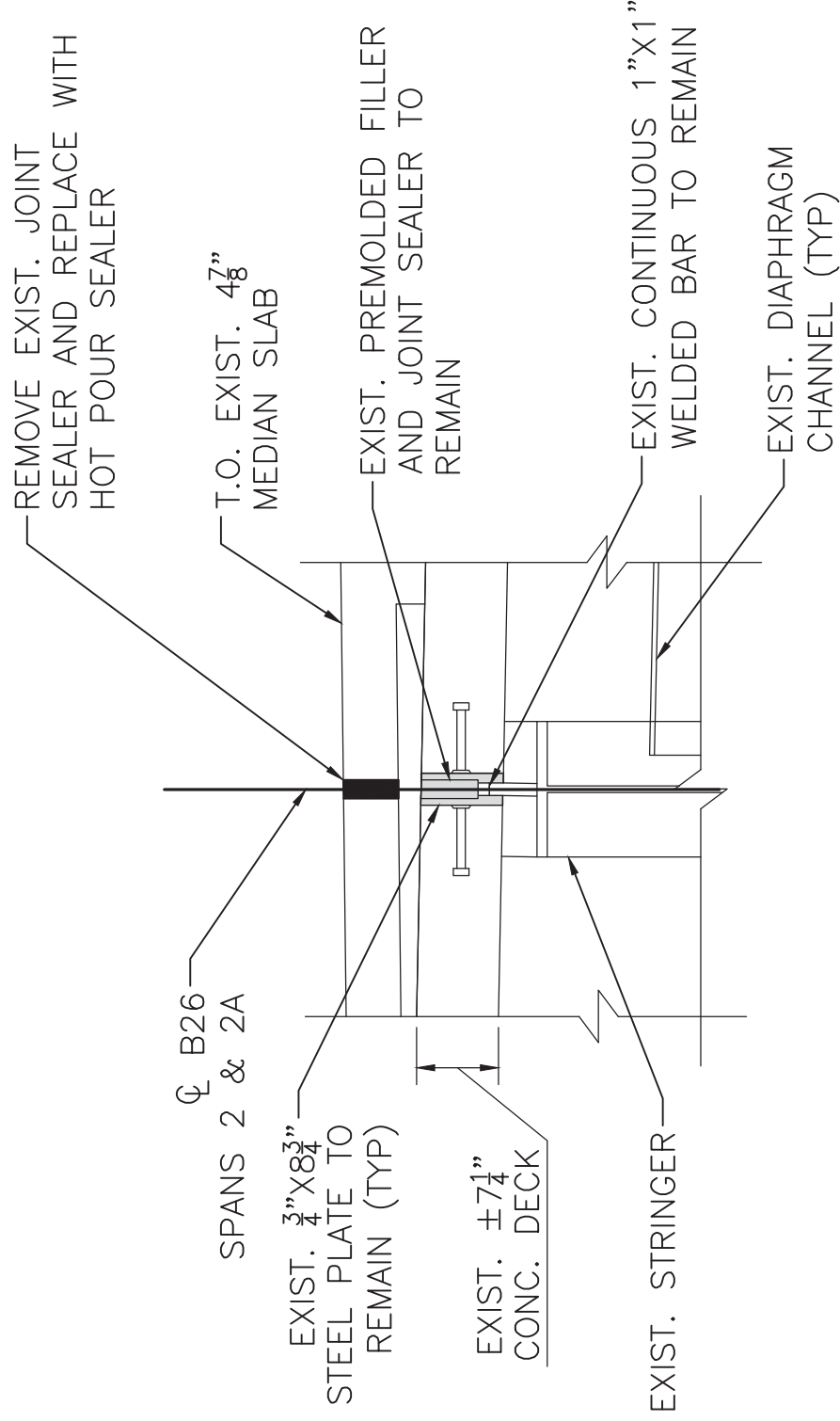


JOINT SEAL REPLACEMENT – AT ROADWAY EAST AND WEST EXPANSION BENTS

NOT TO SCALE

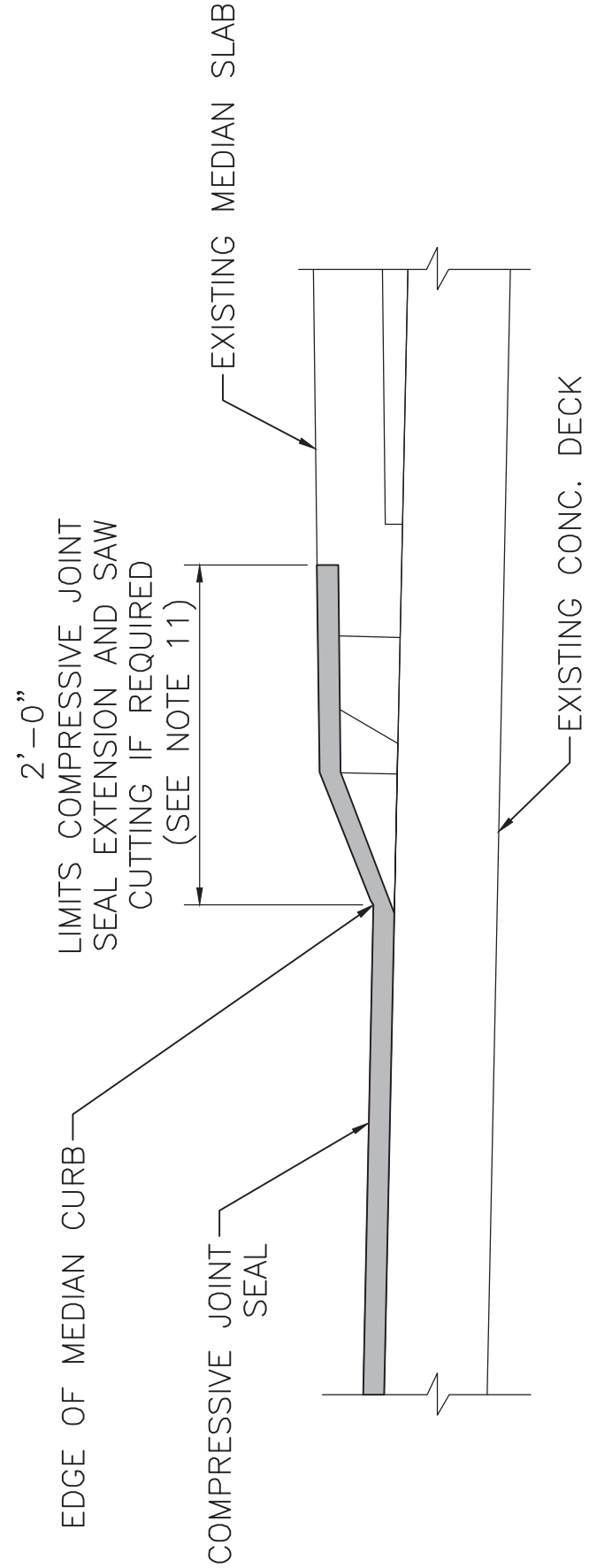
NOTES:

1. DIMENSION "X" TO VERIFIED IN THE FIELD AS FOLLOWS:
TYPE 1: EAST AND WEST EXPANSION BENTS
TYPE 2: NORTH AND SOUTH FIXED BENTS



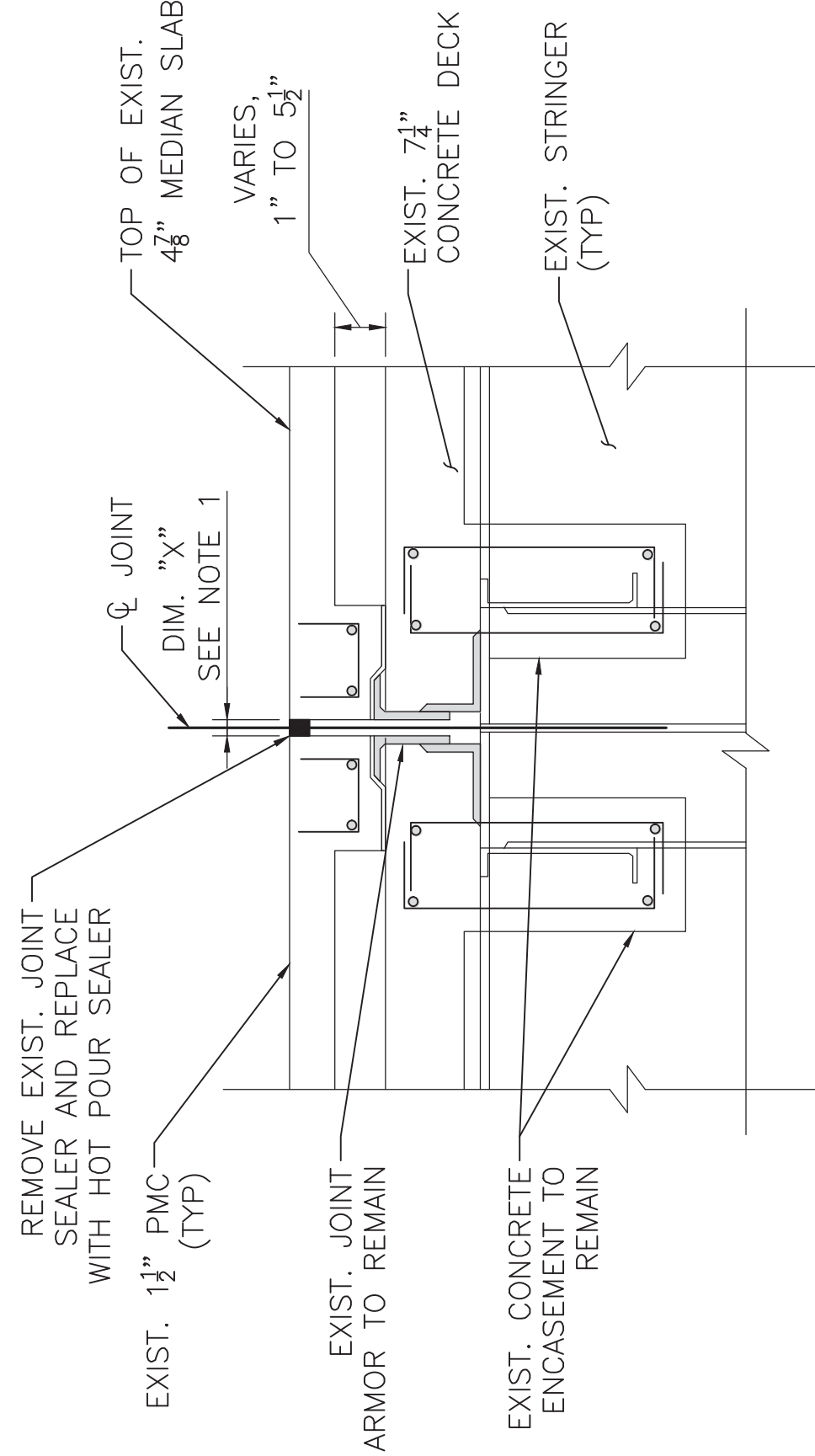
JOINT SEALER REPLACEMENT, BEAM 26

NOT TO SCALE



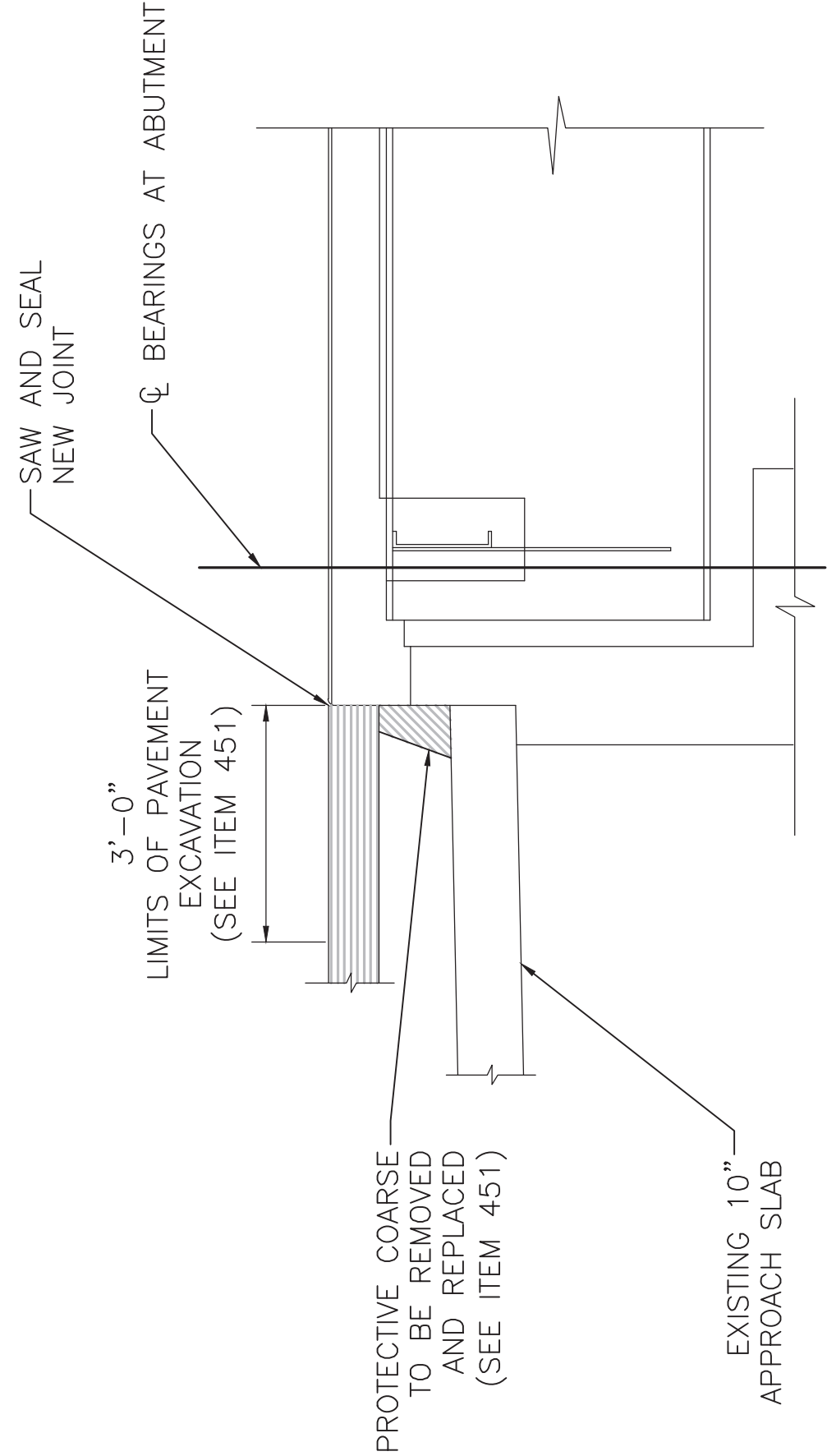
COMPRESSIVE SEAL DETAIL AT MEDIAN CURB

NOT TO SCALE



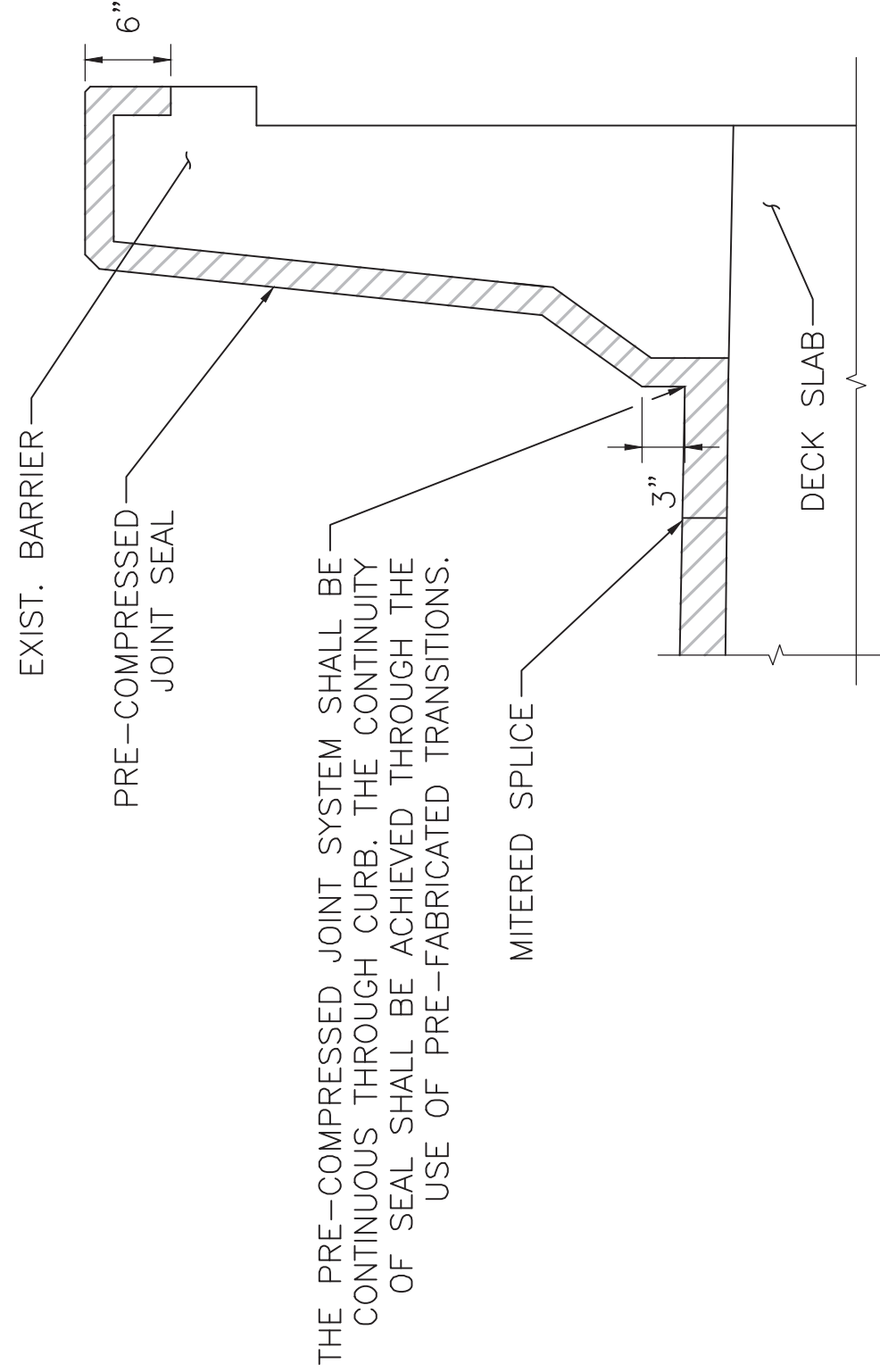
JOINT SEAL REPLACEMENT – AT CONCRETE MEDIAN EAST AND WEST EXPANSION BENTS

NOT TO SCALE



SECTION AT APPROACH SLAB

NOT TO SCALE

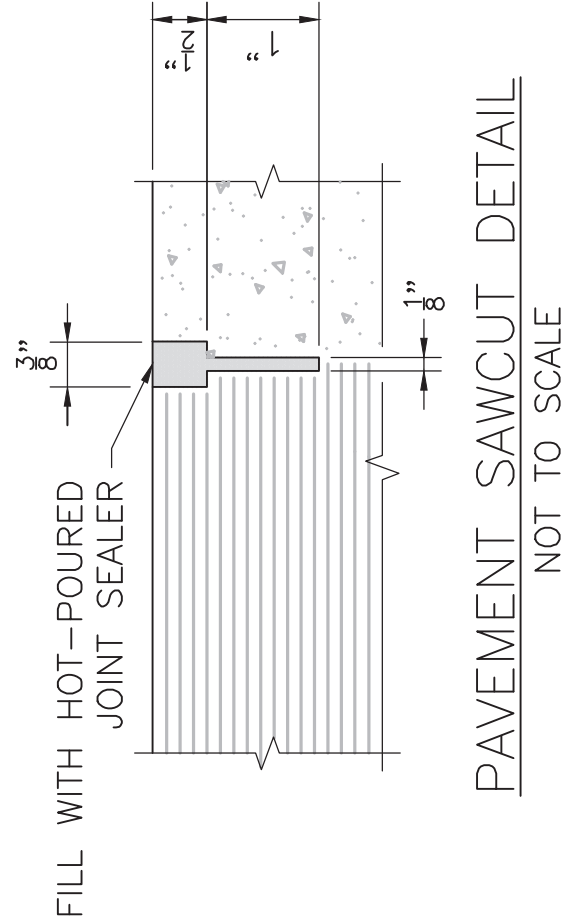


PRE-COMPRESSED SEAL SECTION AT BARRIER

SCALE: 1" = 1'-0"

JOINT SEAL CONSTRUCTION SEQUENCE NOTES:

1. ALL JOINT WIDTH AND LENGTH DIMENSIONS SHALL BE FIELD MEASURED BY THE CONTRACTOR AT 5 FT MAXIMUM INTERVALS ALONG THE LENGTH OF EACH JOINT PRIOR TO THE INSTALLATION OF THE PRE-COMPRESSED JOINT SYSTEM. THOSE DIMENSIONS SHALL BE FORWARDED TO THE JOINT MANUFACTURER AS PART OF THE "BRIDGE CHECKLIST" PRIOR TO ORDERING JOINT MATERIALS.
2. THE PRE-COMPRESSED SEAL JOINT SYSTEM SHALL BE THE BEUS SYSTEM MANUFACTURED BY EMSEAL JOINT SYSTEM, LTD, OR APPROVED EQUIVALENT.
3. IMPLEMENT TRAFFIC CONTROL PLAN FOR THE EXISTING JOINT REPLACEMENT.
4. REMOVE THE EXISTING NEOPRENE STRIP SEAL.
5. THE JOINT OPENING SHALL BE FREE OF ALL CONTAMINANTS SUCH AS GREASE, DUST, AND DIRT. PRIOR TO JOINT SYSTEM INSTALLATION, THE JOINT WALLS SHALL BE BLOWN CLEAN WITH OIL-FREE COMPRESSED AIR AND WIPED CLEAN WITH A CLEAN WET CLOTH TO THE BOTTOM OF THE PRE-COMPRESSED SEAL MATERIAL PLUS 1" TO REMOVE ANY DUST REMAINING. THE SUBSTRATE PREP SHALL FOLLOW THE ICRI CONCRETE SURFACE PROFILE STANDARDS TO ACHIEVE A SURFACE PROFILE OF CSP 2 (MIN.) OR 3 (PREFERRED) IN ORDER TO ACCEPT THE JOINT SYSTEM.
6. THE INSTALLATION AND SPLICING OF THE PRE-COMPRESSED SEAL JOINT SYSTEM SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS.
7. COAT THE SURFACES OF THE BLOCKOUT AND THE REMAINING JOINT OPENING WITH THE POLYMER MODIFIED ASPHALTIC BINDER.
8. IMPLEMENT APPROVED TRAFFIC CONTROL PLAN FOR THE NEXT PHASE OF CONSTRUCTION AND REPEAT STEPS THROUGH.
9. IT IS NOT NECESSARY TO INSTALL THE JOINT AT MEAN TEMPERATURE; HOWEVER, THE MANUFACTURER SHOULD BE CONSULTED FOR INSTALLATION GUIDELINES FOR EXTREME CLIMATE CONDITIONS.
10. THE PRE-COMPRESSED SEAL JOINT SHALL BE CONTINUOUS THROUGH BARRIERS/PARAPETS AS APPROPRIATE TO THE CONDITIONS AT HAND. CONTINUITY OF THE SEAL SHALL BE ACHIEVED THROUGH THE USE OF FACTORY FABRICATED UNIVERSAL OR CUSTOM TRANSITIONS SUPPLIED BY THE PRE-COMPRESSED JOINT SEAL MANUFACTURER. THE FIELD SPLICING OF THE PRE-COMPRESSED JOINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
11. THE PRE-COMPRESSED JOINT SEAL IS TO BE INSTALLED AT A CONSISTENT WIDTH FOR THE ENTIRE LENGTH OF THE JOINT. THE MEDIAN SLAB HAS A THINNER JOINT GAP THAN THE ADJACENT BRIDGE JOINT. TO ALLOW FOR THE INSTALLATION OF THE PROPOSED PRE-COMPRESSED JOINT SEAL EXTENSION INTO THE MEDIAN SLAB, CONTRACTOR TO SAWCUT THE MEDIAN SLAB AS REQUIRED BY THE ENGINEER. THE SAWCUTTING SHALL BE CONSIDERED INCIDENTAL TO THE PRE-COMPRESSED JOINT SEAL ITEM 973.1.



MIDDLEBOROUGH

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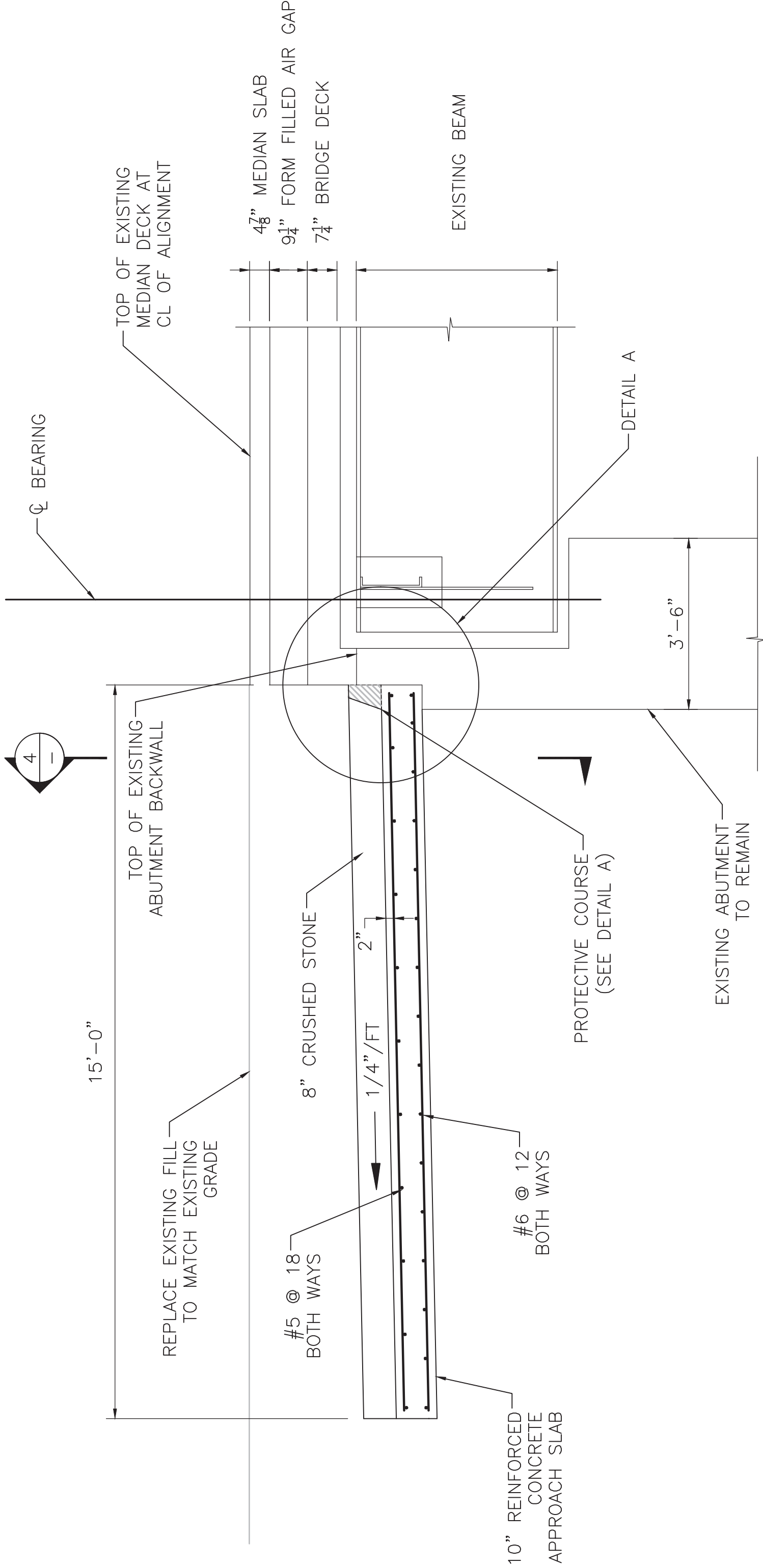
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	14	28
PROJECT FILE NO. 612743		612743	

JOINT REPAIR DETAILS

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MA	NFA	15	28
PROJECT FILE NO.		612743	

MEDIAN APPROACH SLAB DETAILS

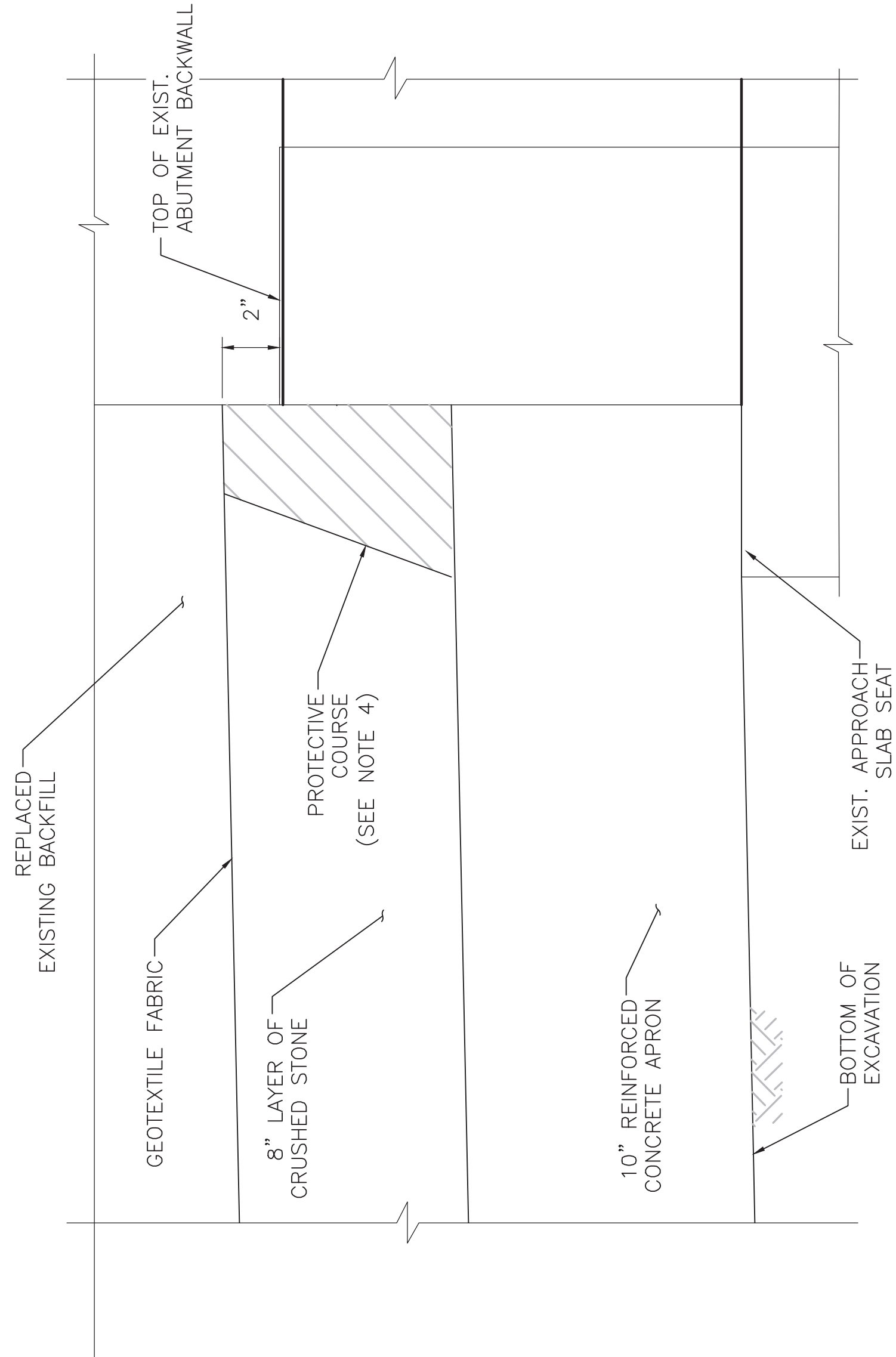


APPROACH SLAB NOTES:

- IF THE SHOWN ELEVATION OF THE MEDIAN SLAB IS HIGHER THAN THE APPROACH SLABS ON EITHER SIDE, THE CONTRACTOR IS TO LOWER THE MEDIAN SLAB TO MATCH THE LOWEST ELEVATION.
- THE MEDIAN SLAB IS TO SLOPE FROM EITHER SIDE TOWARDS THE CENTER LINE OF THE STRUCTURE AT 1/4" PER FOOT.
- TOP OF APPROACH SLAB ELEVATIONS SHOWN ON THESE PLANS ARE APPROXIMATE AND BASED ON AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS AND DEPTH OF EXCAVATION.
- PROTECTIVE COURSE TO BE HMA FOR PATCHING, PLACED IN 2" LAYERS AND COMPACTED WITH A MECHANICAL HAND-GUIDED TAMPER, SEE ITEM 451.
- CONCRETE SHALL BE 4,000 PSI. 1½ IN., 565 CEMENT CONCRETE, SEE ITEM 901.

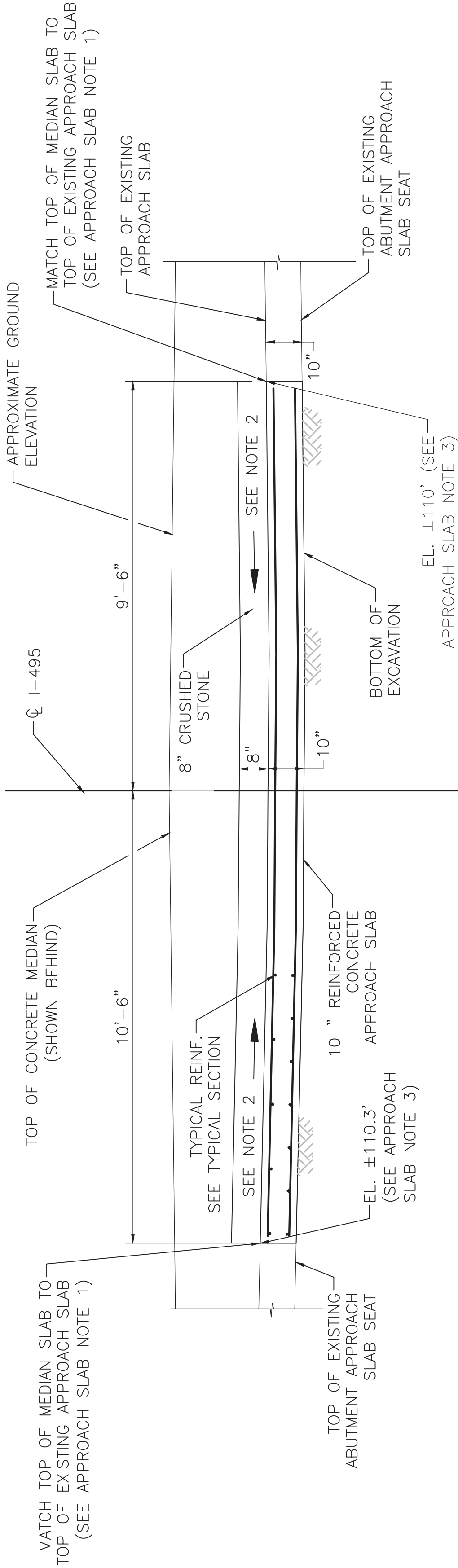
MEDIAN APPROACH SLAB: TYPICAL SECTION

SCALE: ½" = 1'-0"



DETAIL A: APPROACH SLAB PROTECTIVE COURSE

NOT TO SCALE



SECTION 4
NOT TO SCALE

NOTES:

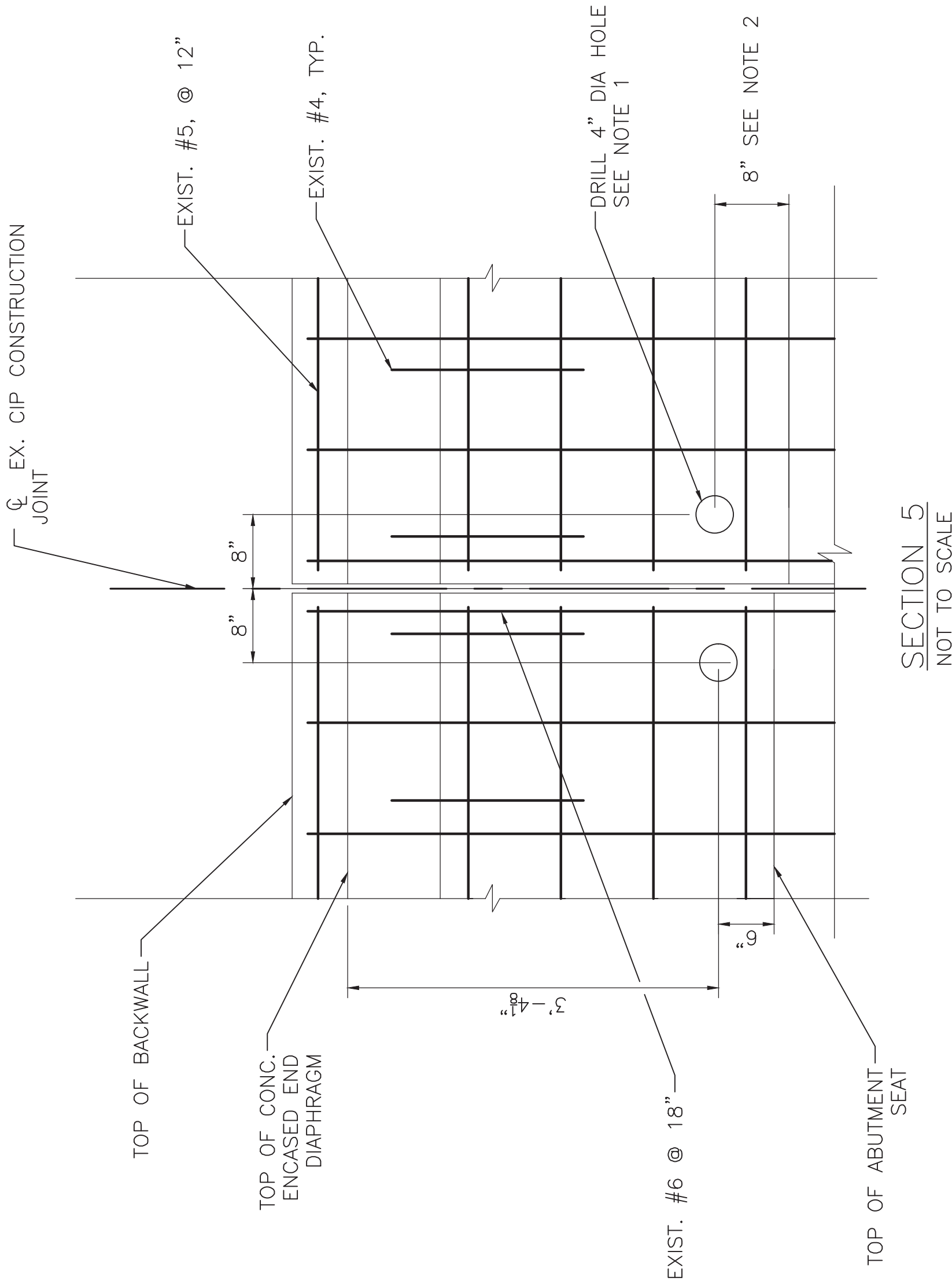
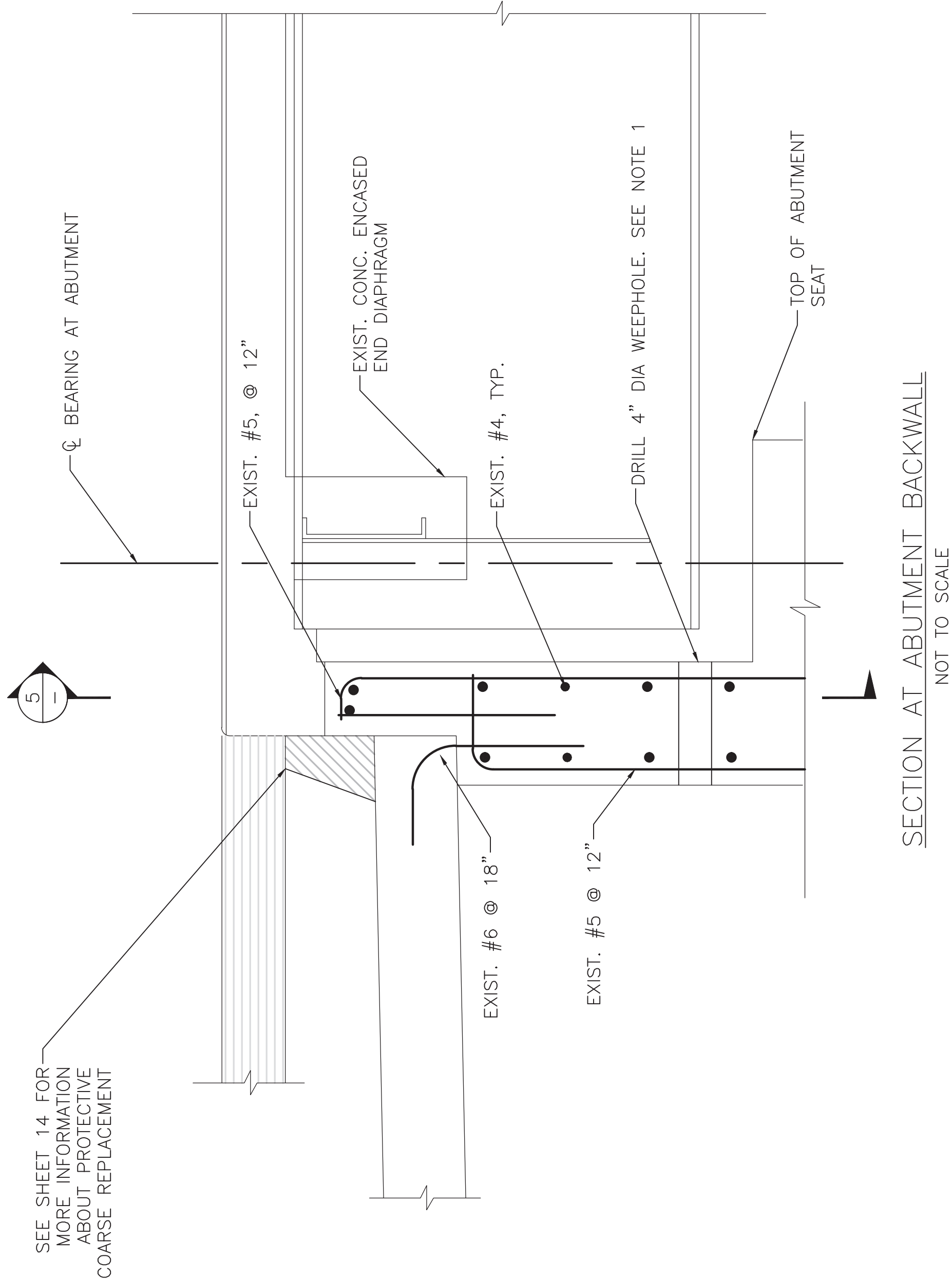
- EAST ABUTMENT SHOWN, WEST ABUTMENT SIMILAR.
- THE TOP LAYER OF CRUSHED STONE, GEOTEXTILE FABRIC, AND FILL TO EXISTING GRADE NOT SHOWN FOR CLARITY.

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MIDDLEBOROUGH
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MA	NFA	16	28
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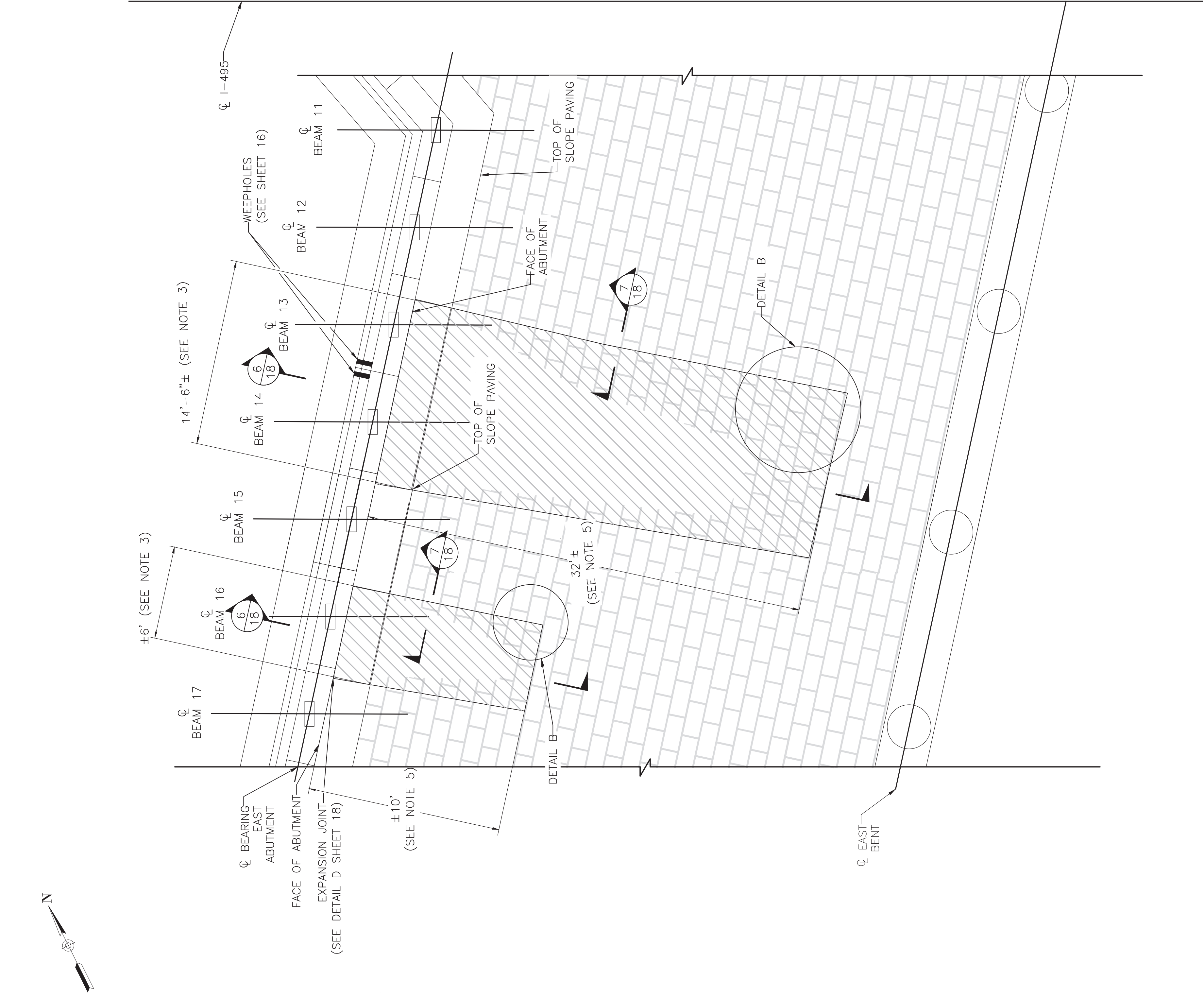
ABUTMENT WEEPHOLE DETAILS



WEEPHOLE NOTES:

1. 4" ϕ WEEPHOLES TO BE PLACED AT SPECIFIED LOCATION TO MAINTAIN PROPER DRAINAGE AND AVOID REBAR.
2. CONTRACTOR TO VERIFY REBAR LOCATION BEFORE CORING. IF REBAR IS FOUND, CONTRACTOR IS REQUIRED TO RELOCATE THE HOLE, AS DIRECTED BY THE ENGINEER.
3. INSTALL CLEANABLE FILTER CARTRIDGE SUITABLE FOR INSTALLATION IN A 4" DIAMETER HOLE. SEE ITEM 968.5 FOR MORE INFORMATION ON FILTER CARTRIDGE.

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EAST ABUTMENT SLOPE PAVING REPAIRS: PLAN VIEW
SCALE: 1" = 50'-0"

NOTE:
FACE OF ABUTMENT FOOTING NOT SHOWN FOR CLARITY.

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PROJECT FILE NO.		612743	

SPECIAL SLOPE PAVING DETAILS (1 OF 2)

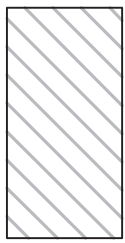
SUGGESTED SLOPE PAVING RECONSTRUCTION SEQUENCE:

1. REMOVE ALL DISLODGED GRANITE OR CONCRETE BLOCKS AND ERODED SOIL.
2. CONTRACTOR MUST SAW CUT OR REMOVE PERIMETER BLOCKS TO PROVIDE A SMOOTH FACE AROUND THE PERIMETER OF THE NEW SLOPE PAVING AREA CURTAIN WALLS.
3. BACKFILL EXCAVATED AND CLEANED AREA WITH NEW BACKFILL.
4. PLACE A LAYER OF GEOTEXTILE FABRIC OVER NEW BACKFILL.
5. PLACE AN 8" LAYER OF CRUSHED STONE.
6. POUR 6" CONCRETE SLAB WITH GALVANIZED 6"x6"x1/4" DIA WIRE FABRIC 5.2 LBS/SY.
7. FINISHED CONCRETE TO BE STIFF BROOM FINISH WITH GROOVES PERPENDICULAR TO THE SLOPE.

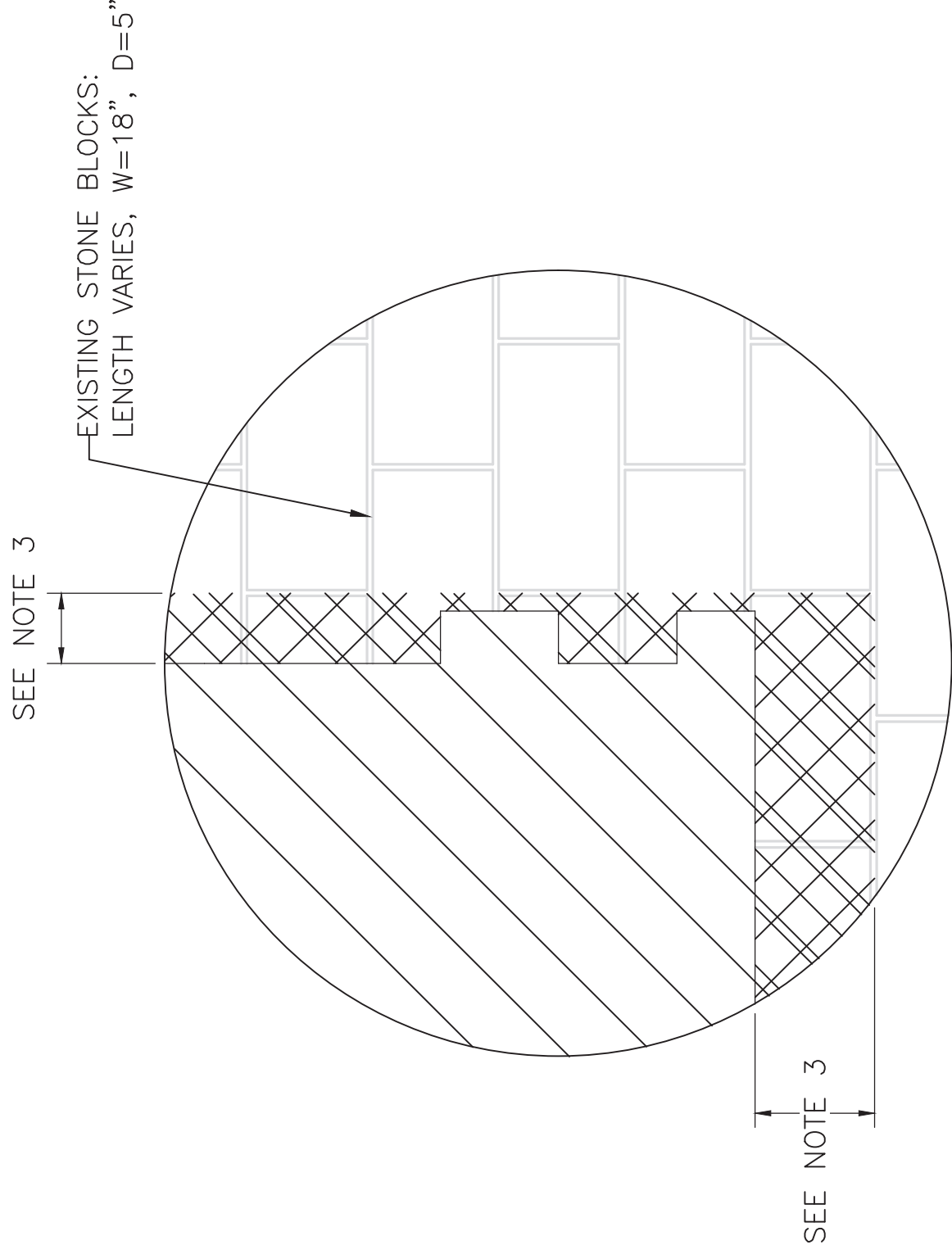
NOTES:

1. THE EXISTING DIMENSIONS OR EXTENTS OF THE ERODED SLOPE PAVEMENT SHOWN ARE APPROXIMATE. CONTRACTOR TO VERIFY THE ACTUAL LIMITS OF THE DISLODGED STONE BLOCKS PRIOR TO CONSTRUCTION.
2. FOR NEW CONCRETE SLOPE PAVING DETAILS, SEE SHEETS 18 AND 19.
3. CONTRACTOR TO REMOVE OR SAW CUT EXISTING STONE BLOCKS TO THE NEAREST GROUT JOINT THAT CREATES A SMOOTH PLANE FOR THE CONSTRUCTION OF THE NEW CURTAIN WALLS.
4. CONTRACTOR HAS OPTION TO USE CRUSHED STONE OR FLOWABLE FILL BELOW THE SPECIAL SLOPE PAVING BASED ON SITE SPECIFIC ACCESS CONSIDERATIONS.
5. LENGTH OF EXCAVATION IS APPROXIMATE, CONTRACTOR TO EXTEND AS NEEDED PER ENGINEERS DIRECTION.

LEGEND



TYPICAL EXTENTS OF STONE BLOCK REMOVAL FOR SLOPE PAVING AND CURTAIN WALL CONSTRUCTION. SEE NOTE 3.



DETAIL B
NOT TO SCALE

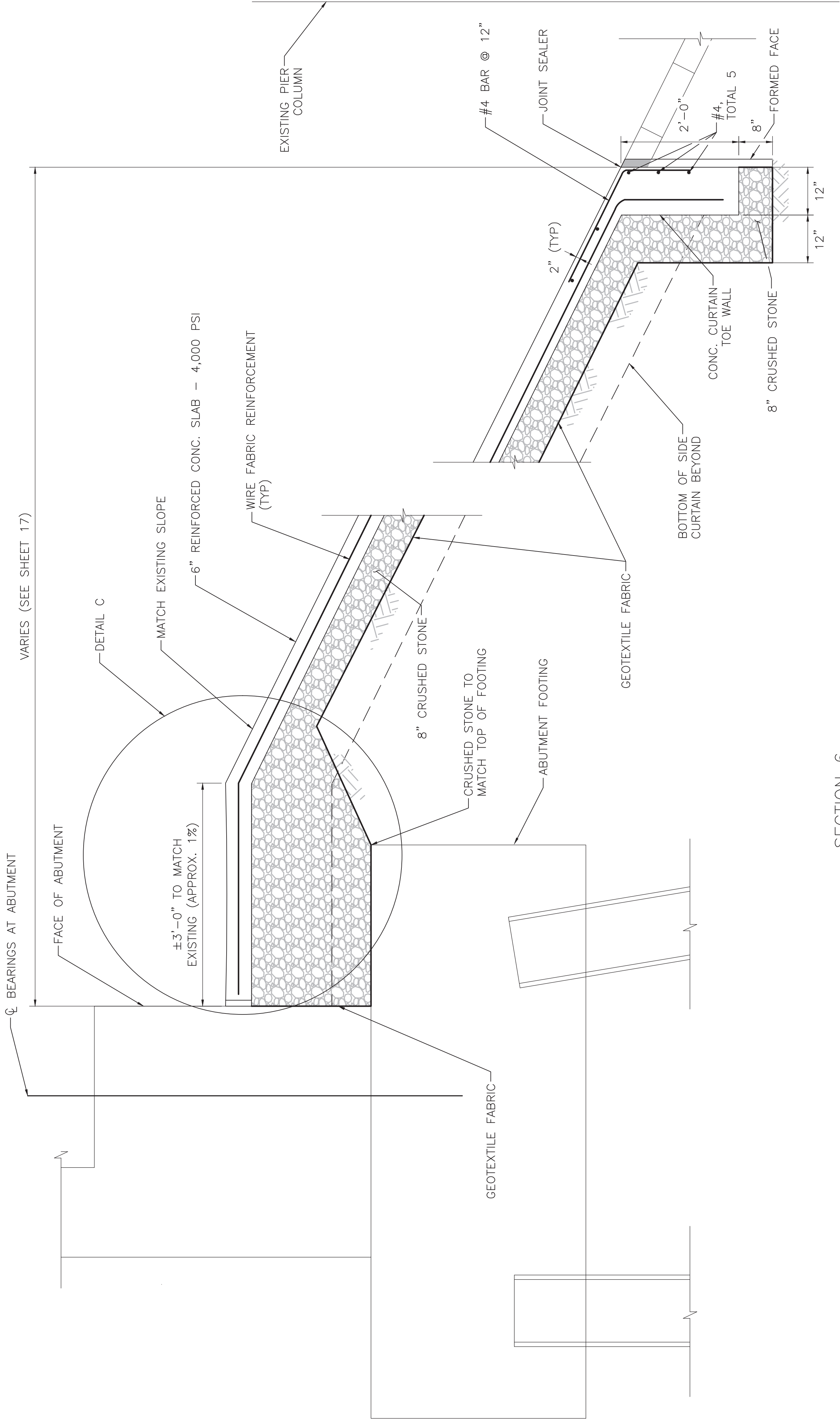
9/16/2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY: _____	
STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

MIDDLEBOROUGH I-495 AT ST105 & MBTA/MACRR				
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	NFA	18	28	
PROJECT FILE NO.			612743	

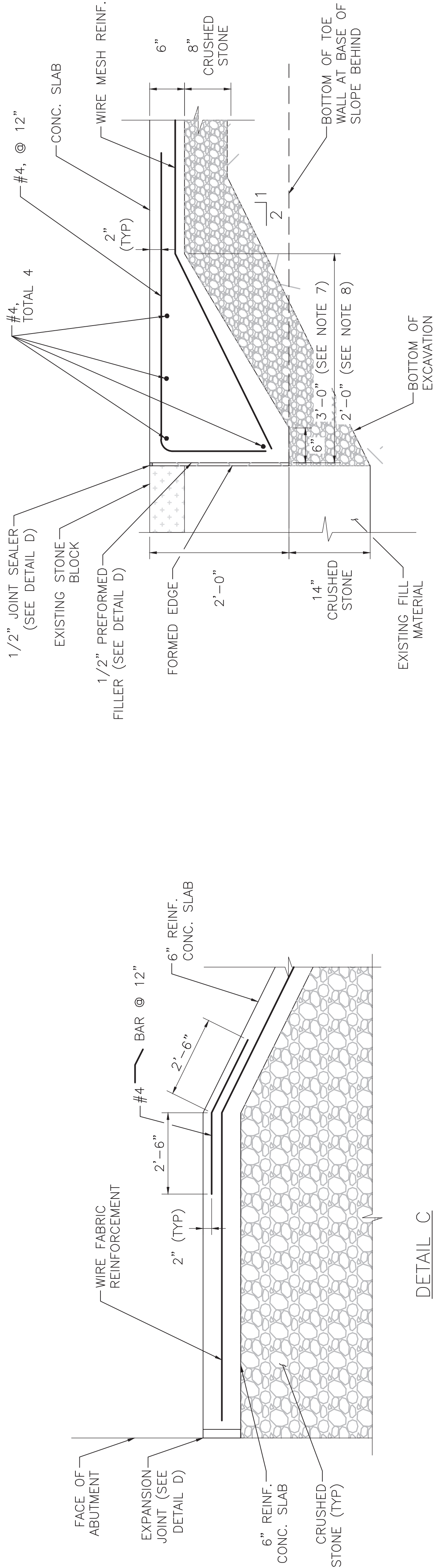
SPECIAL SLOPE PAVING DETAILS (2 OF 2)

NOTES:

- THE WELDED WIRE MESH FABRIC REINFORCEMENT SHALL BE GALVANIZED 6"x6"x1/4" DIA WIRE FABRIC 5.2 LBS/SY.
- WIRE FABRIC TO HAVE 12" MINIMUM LAP AT SPLICE AND SHOULD EXTEND WITHIN 3" OF ALL EDGES.
- FINISHED CONCRETE SHALL BE STIFF BOOM FINISH WITH GROOVES PERPENDICULAR TO THE SLOPE.
- FOR LIMITS OF SLOPE PAVING SEE SHEET 17.
- CONCRETE SHALL BE 4,000 PSI. 3/8 IN., 660 CEMENT CONCRETE, SEE ITEM 905.01.
- EXTEND GEOTEXTILE FABRIC BENEATH CRUSHED STONE FROM TOP OF CONCRETE CURTAIN TOE WALL TO FACE OF ABUTMENT.
- CURTAIN SIDE WALL WIDTH SHALL BE 3'-0" UNDER BEAM 13 AND BEAM 14 SLOPE REPAIR.
- CURTAIN SIDE WALL WIDTH SHALL BE 2'-0" UNDER BEAM 16 SLOPE REPAIR.

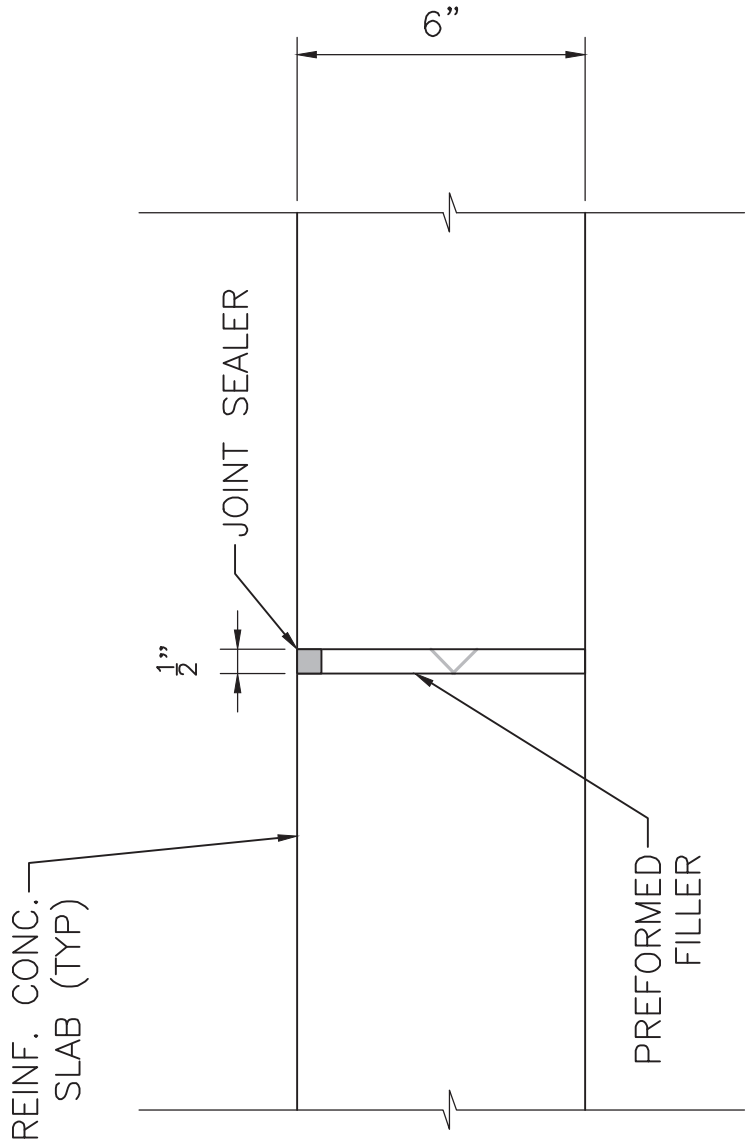


SECTION 6
NOT TO SCALE



DETAIL C
NOT TO SCALE

SECTION 7: CURTAIN ON SIDES OF SLAB
NOT TO SCALE



DETAIL D: EXPANSION JOINT
NOT TO SCALE

9/16/2023	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
THIS SHEET IS APPROVED FOR CONSTRUCTION BY MASSDOT AUTHORIZED SIGNATORY: STATE BRIDGE ENGINEER	
USE ONLY PRINTS OF LATEST DATE	

TRAFFIC MANAGEMENT NOTES

GENERAL

1. ALL TRAFFIC MANAGEMENT AND WORK ZONE TRAFFIC CONTROL MEASURES SHALL CONFORM TO THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), MASSDOT - HIGHWAY DIVISIONS "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS", THE "STANDARD SPECIFICATIONS, AND THE FOLLOWING NOTES.
2. THE TEMPORARY TRAFFIC CONTROL PLANS CONTAINED HEREIN ARE GIVEN AS A GUIDE FOR TYPICAL WORK ZONE TRAFFIC CONTROL APPLICATIONS FOR THE TYPES OF WORK ANTICIPATED FOR THIS PROJECT. THEY ARE NOT INTENDED TO COVER ALL POSSIBLE CONSTRUCTION OPERATIONS WHICH THE CONTRACTOR MAY CHOOSE TO EMPLOY. WORK ZONE TRAFFIC CONTROL FOR OTHER CONSTRUCTION OPERATIONS OR OTHER TRAFFIC SITUATIONS ARE TO BE DEVELOPED IN ACCORDANCE WITH THE REFERENCES LISTED IN NOTE NO. 1 AND AS APPROVED OR DIRECTED BY THE ENGINEER.
3. WITH THE EXCEPTION OF THE PERMANENT LANE CLOSURES REQUIRED FOR STAGED CONSTRUCTION, LANE RESTRICTIONS MAY NOT REMAIN OVERNIGHT OR DURING NON-WORKING HOURS. AFTER EACH WORKING DAY, TRAFFIC CONTROL DEVICES THAT ARE NOT REQUIRED SHALL BE MOVED OFF THE ROADWAY OR FULL DEPTH CONSTRUCTION AREA AND PLACED SO AS NOT TO IMPEDE PEDESTRIAN AREAS, ABUTTER ACCESS OR CAUSE CONFUSION TO MOTORISTS. IN CERTAIN CIRCUMSTANCES, AND ONLY WITH THE APPROVAL OF MASSDOT AND THE ENGINEER, LANE RESTRICTIONS MAY REMAIN OVERNIGHT.
4. CONTRACTOR SHALL PROVIDE A SAFE TEMPORARY PEDESTRIAN ACCESS WHERE EXISTING SIDEWALKS OR OTHER PEDESTRIAN AREAS ARE AFFECTED BY CONSTRUCTION WORK. CONTRACTOR SHALL PROVIDE RAMPS AND RAILINGS IN ACCORDANCE WITH ADA/AB ACCESSIBILITY REQUIREMENTS FROM THE LATEST MASSDOT TTPC TEMPLATES. CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
5. PLACE ALL CONSTRUCTION SIGNING, TRAFFIC CONTROL DEVICES AND TEMPORARY PAVEMENT MARKINGS FOR EACH PHASE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. ONE (1) THRU TRAVEL LANE HAVING A MINIMUM WIDTH OF 11'-0" MUST BE PROVIDED FOR BOTH DIRECTIONS (LANE MAY BE SHARED AND DIRECTION OF TRAVEL TO ALTERNATE UNDER POLICE OFFICER OR FLAGGER CONTROL) DURING ALL PHASES OF CONSTRUCTION AS SHOWN ON THE TEMPORARY TRAFFIC CONTROL PLANS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MINIMUM LANE WIDTH IS MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
7. WHEN WORK INFRINGES UPON THE TRAVELED WAY, WORK SHALL BE RESTRICTED TO OFF-PEAK HOURS ONLY (NORMALLY 9:00 AM TO 4:00 PM, MONDAY TO FRIDAY). THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF ROAD CLOSURE.
8. TAPER LENGTH FORMULAE FOR CHANNELIZATION DEVICES, ENGLISH UNITS:
L = WS²/60 FOR SPEED EQUAL TO OR GREATER THAN 45 M.P.H.
L = WS²/80 FOR SPEED EQUAL TO OR LESS THAN 40 M.P.H.
WHERE: L = MIN. LENGTH OF TAPER, S = POSTED SPEED, W = OFFSET WIDTH.
9. ADVISORY SPEED LIMIT, IF USED, SHALL BE SET IN THE FIELD BY THE ENGINEER. W13-1P PLATES SHALL BE USED WHERE APPROPRIATE.
10. FLASHING ARROW PANEL SHALL BE SET IN "ARROW MODE" WHEN USED FOR ACTUAL LANE CLOSURES ONLY. FOR ALL OTHER APPLICATIONS, FLASHING ARROW PANELS MUST BE ILLUMINATED IN A NON-DIRECTIONAL CAUTION CONFIGURATION TO AVOID UNNECESSARY LANE SHIFTS.
11. DISTANCES SHOWN ON THE TEMPORARY TRAFFIC CONTROL PLANS ARE A GUIDE ONLY, AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
12. THE FIRST TEN (10) REFLECTORIZED DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING WARNING LIGHTS.

GRADE DIFFERENCES

13. CROSS SECTIONAL GRADE DIFFERENCES IN EXCESS OF 2' DURING NON-WORKING HOURS WILL REQUIRE DELINEATION BY USE OF REFLECTORIZED DRUMS.
14. CROSS-SECTIONAL GRADE DIFFERENCES IN EXCESS OF 4" DURING NON-WORKING HOURS SHALL BE PROTECTED BY BACKFILLING WITH A WEDGE OF EARTHWORK TO BE COMPACTED AT 4:1 SLOPE AND WILL ALSO REQUIRE DELINEATION BY USE OF DRUMS.
15. A MINIMUM SLOPE OF 4:1 MUST BE MAINTAINED AFTER WORKING HOURS DURING SUBBASE AND BASE COURSE INSTALLATION ALONG EDGE OF THE TRAVELWAY (SEE DETAIL, THIS SHEET). A MAXIMUM SLOPE OF 8:1 MUST BE MAINTAINED ON ALL ABUTTER ACCESS DRIVES AND A MAXIMUM SLOPE OF 12:1 MUST BE MAINTAINED ON ALL SIDEWALKS.

CONSTRUCTION SIGNING

16. ALL CONSTRUCTION SIGNS SHALL BE BLACK LEGEND ON A REFLECTORIZED ORANGE BACKGROUND UNLESS OTHERWISE NOTED.
17. CONSTRUCTION SIGNING SHOWN ON THESE PLANS SHALL BE REMOVED FROM THE ROADWAY OR COVERED DURING NON-WORKING HOURS.
18. STANDARD ORANGE OR FLUORESCENT RED-ORANGE FLAGS (16"x16" MIN.) MAY BE ATTACHED TWO (2) EACH ON ALL ADVANCE WARNING SIGNS. FLAGS SHALL NOT INTERFERE WITH A CLEAR VIEW OF THE SIGN FACE. IF USED, THE COST FOR THE FLAGS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE SIGNS WITH NO ADDITIONAL PAYMENT.
19. EXISTING GUIDE SIGNS SHALL BE TEMPORARILY RESET AS DIRECTED BY THE ENGINEER.
20. ALL SIGNS, INCLUDING EXISTING, THAT ARE NOT REPRESENTATIVE OF ACTUAL WORK CONDITIONS SHALL BE EITHER COVERED OR REMOVED WHEN NOT APPLICABLE.
21. IF USED, ALL W20-4 AND W20-5 SIGNS SHALL BE TAKEN DOWN OR COVERED AT THE CLOSE OF EACH DAY UNLESS LANE RESTRICTIONS ARE PERMITTED TO REMAIN OVERNIGHT IN ACCORDANCE WITH NOTE NO. 3 ABOVE.
22. USE MA-W20-7b OR W20-7 SIGNS ONLY WHILE POLICE OR FLAGGERS ARE DIRECTING TRAFFIC. THEY SHALL BE TAKEN DOWN OR COVERED AT THE CLOSE OF EACH DAY OR WHEN NOT IN USE.
23. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD NCHRP 350 OR MASH CRASH TESTED SUPPORT. THEY SHALL BE TAKEN DOWN OR COVERED AT THE CLOSE OF EACH DAY OR WHEN NOT IN USE.
- PAVEMENT MARKINGS
24. PAVEMENT MARKINGS WHICH ARE NO LONGER APPLICABLE SHALL BE REMOVED. APPLY TEMPORARY MARKINGS WHERE SHOWN ON THE TEMPORARY TRAFFIC CONTROL PLANS.
25. ON PROJECTS WHERE PAVEMENT OVERLAY IS NOT DESIGNATED, EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH TEMPORARY TRAFFIC CONTROLS SHOULD BE COVERED TEMPORARILY WITH BLACKOUT TAPE, AS DIRECTED BY THE ENGINEER, FOR THE FULL DURATION OF THE PHASE IN PROGRESS. TEMPORARY PAINTED OR REMOVABLE TAPE MARKINGS SHALL BE USED AS NECESSARY FOR ALL PHASES OF CONSTRUCTION.

CHANNELIZATION

26. THE MAXIMUM SPACING BETWEEN CHANNELIZATION DEVICES (DRUMS OR CONES) SHALL BE APPROXIMATELY EQUAL IN FEET TO THE POSTED SPEED LIMIT.
27. REFLECTORIZED CONES SHALL BE 36" HIGH.
28. PLASTIC DRUMS MUST PASS THE CRITERIA SET FORTH IN "THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH)". IF THEY DO NOT MEET THIS CRITERIA, THEY MUST BE REMOVED FROM THE PROJECT.
29. TEMPORARY IMPACT ATTENUATORS MUST MEET THE PERFORMANCE STANDARDS OF MASH.
30. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN "THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH)". IF THEY DO NOT MEET THIS CRITERIA, THEY MUST BE REMOVED FROM THE PROJECT.
31. ALL TEMPORARY TRAFFIC CONTROL EQUIPMENT MUST PASS THE CRITERIA SET FORTH IN THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH) IF THEY DO NOT MEET THIS CRITERIA. THEY MUST BE REMOVED FROM THE PROJECT.

BUFFER SPACING SPEED* (MPH)	DISTANCE (FT)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

*POSTED SPEED, OFF-PEAK
85TH-PERCENTILE SPEED PRIOR
TO WORK STARTING, OR THE
ANTICIPATED OPERATING SPEED.

TRAFFIC MANAGEMENT LEGEND

WORK AREA

DIRECTION OF TRAVEL

SIGN

REFLECTORIZED DRUM OR CONE

REFLECTORIZED DRUM WITH SEQUENTIAL
FLASHING WARNING LIGHT

POLICE CRUISER

PORTABLE TYPE III BARRICADE (4' WIDE, MIN.)

FLASHING ARROW BOARD (30"x 60" STD. SIZE
WITH 13 LAMPS, MIN.) AND MERGE ARROW DISPLAY

WORK VEHICLE

TRUCK MOUNTED ATTENUATOR

ROAD TYPE	DISTANCE BETWEEN SIGNS**		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
FREEWAYS AND EXPRESSWAYS*	1,000	1,500	2,640

Based on: Table 6C-1 MUTCD latest edition

*ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.

**DISTANCES ARE SHOWN IN FEET. THE COLUMN HEADINGS A, B AND C ARE THE DIMENSIONS FOR THE TYPICAL TAPER SETUPS. THE TYPICAL TAPER DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTPC SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA-R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA-R2-10a, MA-R2-10b, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAIL/TYPICAL SETUPS.

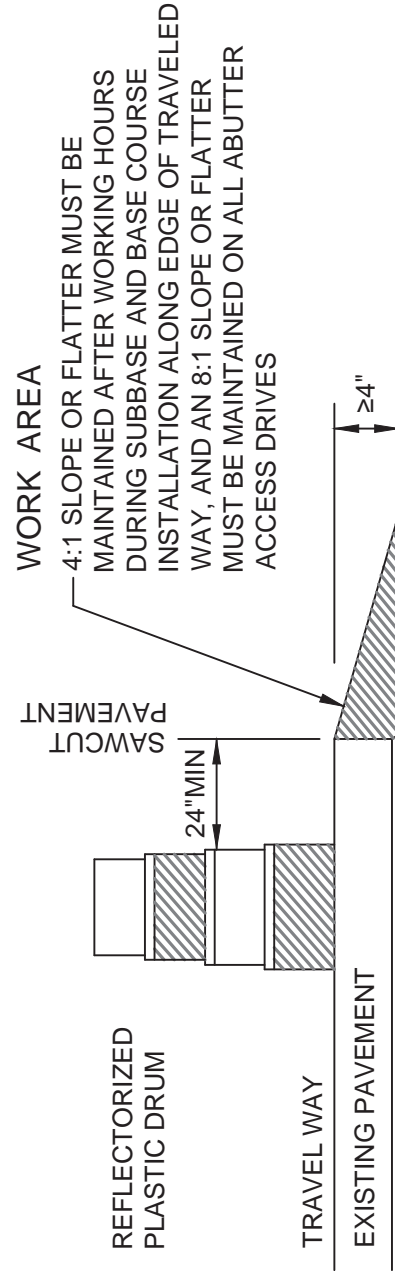
SIGN SPACING MAY NEED TO BE INCREASED IF ADDITIONAL SIGNS ARE REQUIRED PER THE DETAIL/TYPICAL SETUP FIGURES.

CHANNELIZATION

26. THE MAXIMUM SPACING BETWEEN CHANNELIZATION DEVICES (DRUMS OR CONES) SHALL BE APPROXIMATELY EQUAL IN FEET TO THE POSTED SPEED LIMIT.
27. REFLECTORIZED CONES SHALL BE 36" HIGH.
28. PLASTIC DRUMS MUST PASS THE CRITERIA SET FORTH IN "THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH)". IF THEY DO NOT MEET THIS CRITERIA, THEY MUST BE REMOVED FROM THE PROJECT.
29. TEMPORARY IMPACT ATTENUATORS MUST MEET THE PERFORMANCE STANDARDS OF MASH.
30. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN "THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH)". IF THEY DO NOT MEET THIS CRITERIA, THEY MUST BE REMOVED FROM THE PROJECT.
31. ALL TEMPORARY TRAFFIC CONTROL EQUIPMENT MUST PASS THE CRITERIA SET FORTH IN THE MANUAL FOR THE ASSESSMENT OF SAFETY HARDWARE (MASH) IF THEY DO NOT MEET THIS CRITERIA. THEY MUST BE REMOVED FROM THE PROJECT.

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45	360
50	425
55	495
60	570
65	645
70	730
75	820

*POSTED SPEED, OFF-PEAK
85TH-PERCENTILE SPEED PRIOR
TO WORK STARTING, OR THE
ANTICIPATED OPERATING SPEED.



AFTER WORK HOURS TREATMENT
FOR LATERAL SLOPING

NOT TO SCALE

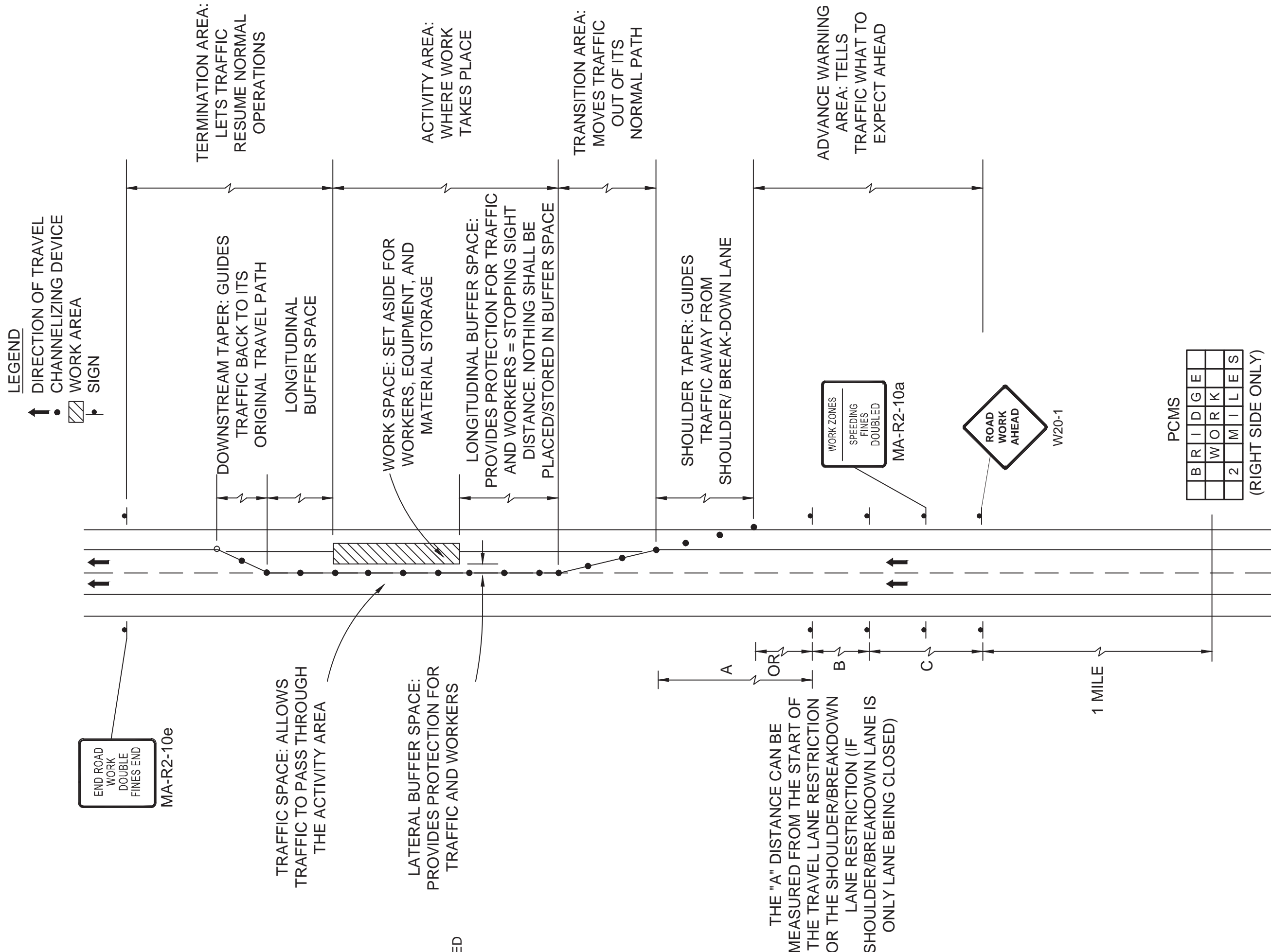
PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL CONFORM TO THE 2009 MUTCD AS AMENDED AND SHOULD BE PLACED ON THE SHOULDER OF THE ROADWAY OR IF PRACTICAL SET WELL AWAY FROM THE TRAVEL LANE. MESSAGE SIGNS SHOULD BE PROTECTED WITH RETROREFLECTIVE TEMPORARY TRAFFIC CONTROL DEVICES WHEN PLACED WITHIN THE AVAILABLE CLEAR ZONE OR ELSE SHIELDED WITH A BARRIER OR CRASH CUSHION. THE LOCATION AND USE OF THE PCMS SHALL BE DETERMINED DURING THE PRE-CONSTRUCTION MEETING. ALTERNATIVE MESSAGES MAY BE DETERMINED BY THE ENGINEER IN THE FIELD.

THE SUGGESTED MESSAGE TWO WEEKS IN ADVANCE AND DURING CONSTRUCTION SHOULD READ AS FOLLOWS:

	TWO WEEKS PRIOR	DURING CONSTRUCTION
(MESSAGE 1)	B R I D G E W O R K 2 M I L E S	B R I D G E W O R K 2 M I L E S
(MESSAGE 2)	B E G I N S X X X X X X	R E D U C E S P E E D
(MESSAGE 1)	B R I D G E W O R K 2 M I L E S	B R I D G E W O R K 2 M I L E S
(MESSAGE 2)	B E G I N S X X X X X X	E X P E C T D E L A Y S

MIDDLEBOROUGH				
I-495 AT ST105 & MBTAMACRR				
STATE	FED AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
MA	NFA	19	28	
PROJECT FILE NO.				612743

TEMPORARY TRAFFIC CONTROL PLANS


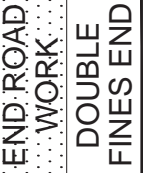


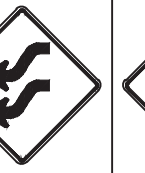


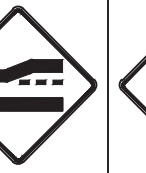



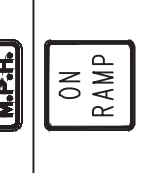



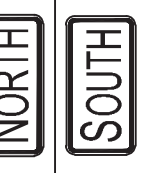


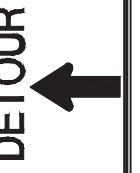






COMPONENT PARTS OF A TEMPORARY
TRAFFIC CONTROL (TTC) ZONE

NOT TO SCALE

ALL PROPOSED BRIDGE CONSTRUCTION
WILL BE PERFORMED AS NIGHT WORK

CONSTRUCTION SIGN SUMMARY

IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET			
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING		BACK- GROUND	LEGEND	BORDER					
MA-R2-10a	60"	48"		MASSDOT STANDARD	8	MASSDOT STANDARD	MASSDOT STANDARD	MASSDOT STANDARD	MASSDOT STANDARD	20.00	160.00			
MA-R2-10e	48"	60"		MASSDOT STANDARD	6					MASSDOT STANDARD	20.00	120.00		
MA-M1-5a (495)*	45"	36"		MASSDOT STANDARD	14					FLUORESCENT ORANGE W/ BLACK LEGEND AND BORDER	11.25	157.50		
R11-2	30"	48"		MUTCD STANDARD	4					MUTCD STANDARD	MUTCD STANDARD	MUTCD STANDARD	10.00	40.00
W1-4bL	48"	48"			1								16.00	16.00
W1-4bR	48"	48"			1								16.00	16.00
W4-2L	48"	48"			4								16.00	64.00
W4-2R	48"	48"			2								16.00	32.00
W4-6R	48"	48"			2								16.00	32.00
W5-1	48"	48"			1								16.00	16.00
W5-4	36"	36"			2	9.00	18.00							
W13-1p	30"	30"			2	6.25	12.50							
W13-4	36"	36"			2	9.00	18.00							
W20-1	48"	48"		MUTCD STANDARD	2	MUTCD STANDARD	MUTCD STANDARD	MUTCD STANDARD	16.00	32.00				
W20-5L	48"	48"			4				16.00	64.00				
W20-5R	48"	48"			2				16.00	32.00				
M3-1*	30"	15"			7				3.13	21.88				
M3-3*	30"	15"			7				3.13	21.88				
M4-9R*	48"	36"			6				12.00	72.00				
M4-9L*	48"	36"			4				12.00	48.00				
M4-9V*	48"	36"			4				12.00	48.00				
M4-8a*	48"	36"			2				12.00	24.00				
M4-10R	48"	18"			2				6.00	12.00				

* TO MOUNT WITH 2-16"x16" ORANGE FLAGS
(SEE DETOUR GUIDE SIGN ASSEMBLY DETAIL)

MIDDLEBOROUGH
I-495 AT ST105 & MBTA/MACRRR

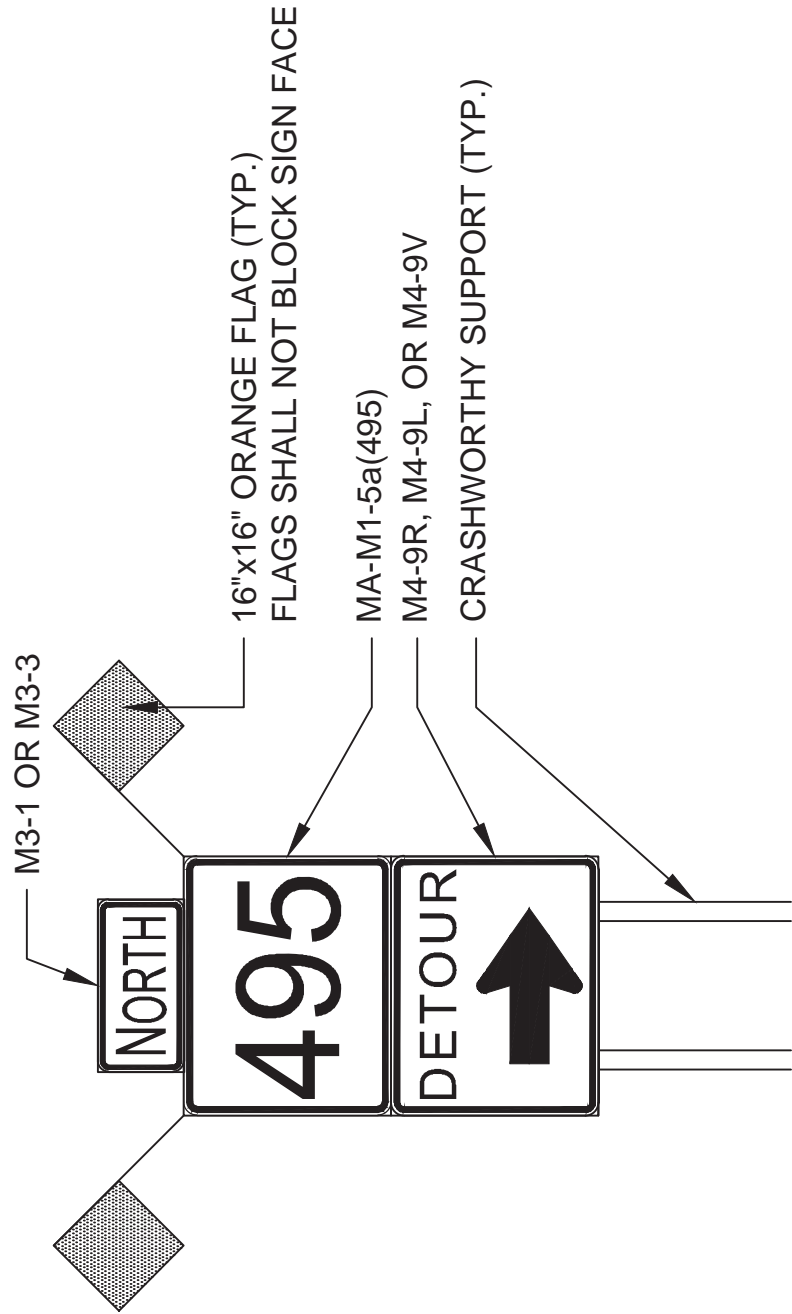
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	NFA	20	28
PROJECT FILE NO.			612743

MIDDLEBOROUGH
I-495 AT ST105 & MBTAMACRR

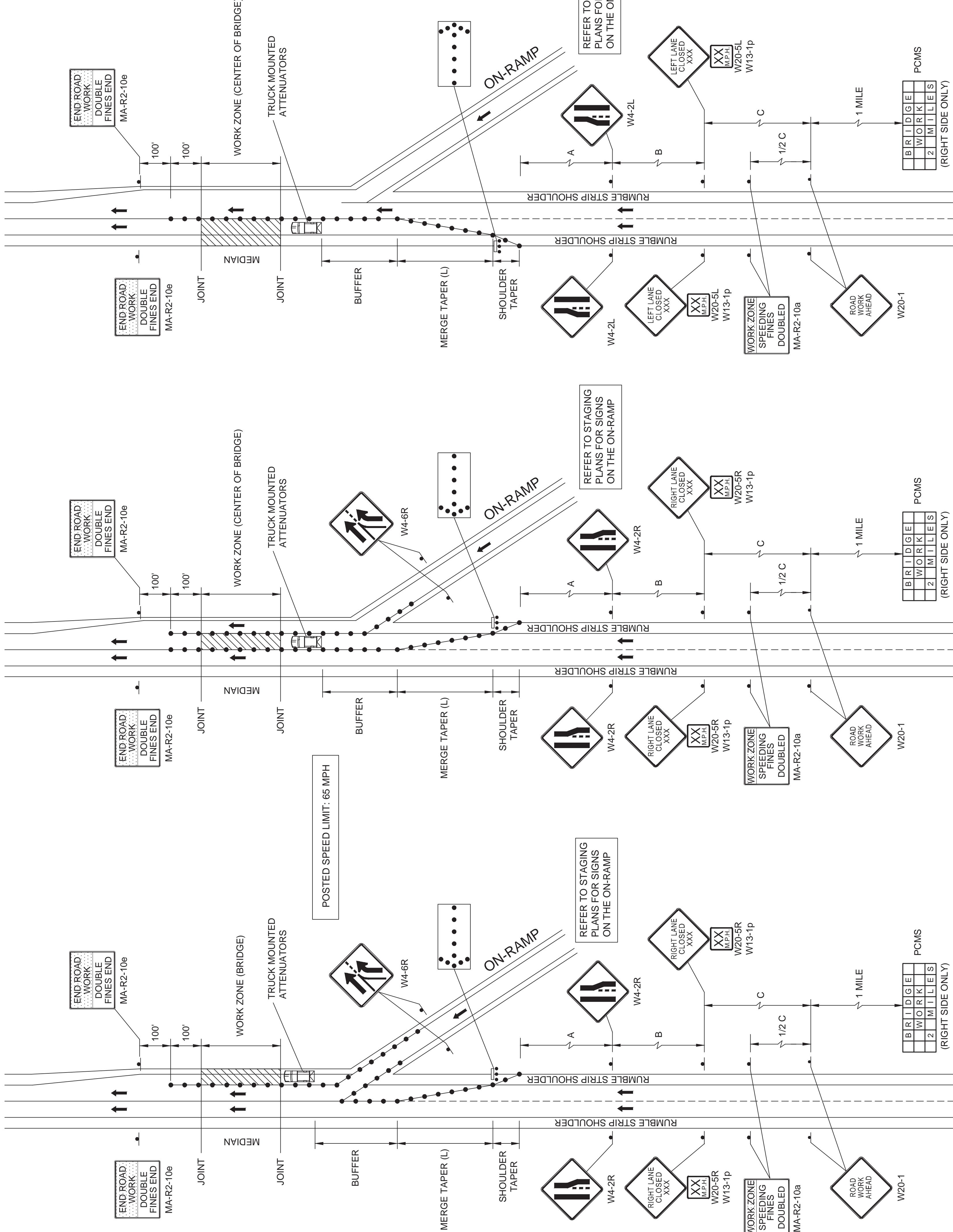
TEMPORARY TRAFFIC CONTROL PLANS

DETOUR GUIDE SIGN
ASSEMBLY DETAIL

NOT TO SCALE



TEMPORARY TRAFFIC CONTROL PLANS



**DIVIDED HIGHWAY/
ACCELERATION LANE CLOSURE -
INTERSTATE HIGHWAY
(SHORT TERM)**

DIVIDED HIGHWAY/ RIGHT-THRU-LANE CLOSURE - INTERSTATE HIGHWAY (SHORT TERM)

DIVIDED HIGHWAY/ LEFT-LANE CLOSURE - INTERSTATE HIGHWAY (SHORT TERM)

MULTIPLE LANE ROAD
INTERIOR LANE CLOSURE
NOT TO SCALE

ALL PROPOSED BRIDGE CONSTRUCTION WILL BE PERFORMED AS NIGHT WORK